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Breeding Methods

PEARL MILLET WITH HIGHER STOVER YIELD AND BETTER FORAGE QUALITY: IDENTIFICATION OF NEW GERmplasm AND CULTIVARS

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Pearl millet is a source of both food grains for humans and dry fodder for their ruminant livestock in the semi-arid and arid tropics of Asia and Africa. Recently, pearl millet has occupied large areas during summer season in India and is also in great demand in central Asian countries for cultivation as forage crop, but very few cultivar options are available to farmers for this ecology. The objective of this study was to: 1) identify sources of higher stover yield and fodder quality traits, 2) initiate their utilization in breeding programs; and 3) identify OPVs and hybrids with higher stover yield and fodder quality. A set of 242 pearl millets from a minicore collection was evaluated for stover linked traits during summer and rainy seasons of 2013 at ICRISAT, Patancheru. Based on 2-season evaluation, about 10% best (21 accessions) having high fresh stover yield (23 to 38 tons ha⁻¹) and dry stover yield (8 to 13 tons ha⁻¹) at 85–90 days after planting were selected and further evaluated in the rainy season of 2014 along with checks at 6 locations in India. The dry stover yield of check OPVs varied from 15–21 tons ha⁻¹, and in check hybrids from 16 tons (DFMH 30) to 19.7 tons ha⁻¹ (Nutrifeed). IP 22269 had highest dry stover yield (19 tons ha⁻¹), followed by IP 20577 (18 tons ha⁻¹) and IP 20409 (16.6 tons ha⁻¹) and total of 11 accessions had dry stover yield of >14 tons ha⁻¹. These accessions were also evaluated at ICRISAT during rainy season of 2014 along with earlier identified OPVs/germplasm accessions and top-cross hybrids. The identified 21 accessions had a wide range of stover nitrogen content (0.88 to 1.24%), *in vitro* digestibility (39.8 to 45.4%), and metabolizable energy (ME) (5.3 to 6.4 MJ·kg⁻¹). Twenty of these identified accessions had *in vitro* digestibility of >40%; and IP 14294 had highest *in vitro* digestibility (45.4%) along with highest ME (6.4 MJ·kg⁻¹). These identified accessions were subjected to inbreeding yielding about 270 early generation inbreds (S₁s-S₃s), which will further be used for deriving breeding lines for the development of new hybrids and OPVs with high stover yield and fodder quality. Also, based on 2-year (2013 and 2014) multilocation evaluation at 5 locations in each year for stover yield and at one location (ICRISAT) for stover quality traits, five OPVs/germplasm accessions having high stover yield in the range of 16.3 to 17.8 tons ha⁻¹, and *in vitro* digestibility from 42 to 45%; and five top cross hybrids having dry stover yield of 13.6 to 15.9 tons ha⁻¹, with *in vitro* digestibility from 38.9 to 42.6% were identified; though top cross hybrids matured about 10–15 days earlier than the OPVs/