

sunnhemp accession no. 037. This variety was evaluated in All India Network Project on Jute and Allied fibres (AINP-J&AF) trials in IET, AVT-1, AVT-II and Adaptive trials during the years 2008 to 2011 at multi-locations viz. Rahuri, Pratapgarh, Kalyani, and Aduthurai. The performance of this genotype was excellent with respect to yield and vascular wilt resistance. It out yielded the national checks K 12 yellow and SH-4. It gave an average fibre yield of 10-12 q/ha under normal conditions with very good fibre quality. Its fibre tenacity (21.0 g/tex) is 32.91% and 34.62% higher than check varieties K 12 Yellow (15.8g/tex) and SH 4 (15.6g/tex), respectively which offer an additional benefit of better fibre quality.

The variety Ankur is comparatively resistant to biotic and abiotic stresses and possesses a high degree of resistance to vascular wilt as compared to the checks namely, K 12 yellow and SH-4. It is mainly suitable for rainfed mid-and high land agro-ecological conditions where sunnhemp is grown. The variety has been recommended for Bihar, Uttar Pradesh, Madhya Pradesh, Maharashtra, Odisha and Rajasthan. Early sown crop is free from top shoot borer, hairy caterpillar and other insect pests. The plant height of this variety is 2.80m to 3.10m with basal diameter of 8-11 mm. It is early maturing strain ready for harvest within 90-100 days for fibre and 140-145 days for seed purpose. The seed coat colour of Ankur variety is deep brownish, stem colour is green with ribbed surface and less branching.

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Pearlmillet

Variety Dhanashakti

Despite impressive records of economic growth and agricultural production in India, about 80% of the pregnant women, 52% of the non-pregnant women, and 74% of the children in 6-35 months age group suffer from iron deficiency. About 52% of the children below 5 years are zinc deficient. Crop biofortification is increasingly being recognized as a cost-effective and sustainable approach to address this problem. Pearl millet, in general, has higher iron (Fe) and zinc

(Zn) contents than other major cereals such as wheat, rice, maize and sorghum. Earlier studies have shown large variability for Fe and Zn contents in the breeding lines, hybrid parents, hybrids, improved populations and germplasm; and also identified ICTP 8203, a released open-pollinated variety (OPV) under cultivation, having the highest level of Fe content.

OPVs in pearl millet, like in other cross-pollinated crops, are genetically heterogeneous populations with significant variability for quantitative traits. Based on this premise, ICTP 8203 was subjected to 3 generations of progeny-based selection to improve for Fe content in its grain. Selfed seeds of 570 plants produced in 2007 rainy season were analyzed for Fe content using Perl's Prussian Blue staining, and 313 plants with 3 and 4 scores (on 1-4 scale) indicative of average to high Fe content were advanced for S₁ progeny testing in 2008 summer season. The Fe density in the selfed seeds of these progenies varied from 43 to 122 ppm, of which 187 progenies with 75-122 ppm Fe content were re-evaluated in 2008 rainy season. The Fe content in these progenies varied from 65 to 194 ppm, of which 62 progenies with 131-194 ppm Fe content were further bulk advanced for S₂ progeny testing in 2009 rainy season. The Fe content in these progenies varied from 81 to 161 ppm. Selfing in pearl millet leads to reduction in seed set, which may vary from genotype to genotype. By the time the S₂ progenies were developed, it was observed, and later confirmed, that reduction in seed set under selfing leads to variable overestimates of both Fe and Zn contents. Thus, S₃ progeny bulks derived from these 62 S₂ progenies were also evaluated for seed set in 2010 summer season. The seed set under selfing in these progenies varied from 10 to 65%. The focus was to develop a higher-iron version of ICTP 8203, without compromising on grain yield and without changes in other traits. Therefore, 11 S₃ progenies with 92-165 ppm Fe content and 40-65% selfed seed set were selected and random mated in the late summer planting to constitute an improved higher-iron version of ICTP 8203, which was designated and tested as ICTP 8303 Fe10-2, and later named and released as Dhanashakti. These improved and original versions were evaluated in 10 field trials conducted by ICRISAT and MPKV, Rahuri in Maharashtra and Andhra Pradesh in 2010. In 2011, these varieties were re-evaluated in 39 trials conducted by the All India Co-ordinated Pearl Millet Improvement Project (AICPMIP), Mandor, Jodhpur; MPKV, Rahuri; and Nirmal Seeds Company in Maharashtra, Andhra

Pradesh, Karnataka and Tamil . Open-pollinated (OP) grain samples received from these trials were analysed for Fe and Zn contents.

Based on the mean performance across 42 trials and X-ray Fluorescence Spectroscopy (XRF) analysis of OP grain samples done at ICRISAT, Dhanashakti had 81 ppm Fe density (9% higher than ICTP 8203) and it also had 43 ppm Zn density, comparable with ICTP 8203 (42 ppm). Further analysis of these OP grain samples using highly sensitive Inductively Coupled Plasma Spectroscopy (ICP) and done at the Waite Analytical Services Laboratory, Adelaide, Australia, showed Dhanashakti having 72 ppm Fe content, again showing its 9% superiority over ICTP 8203 (66 ppm). Interestingly, Dhanashakti produced mean grain yield of 2.2 t/ha which was 11% higher than that of ICTP 8203 (1.97 t/ha). Also it yielded 5.3 t/ha of dry stover yield that was 13% higher than that of ICTP 8203 (4.7 t/ha). While both varieties were similar for time taken to flowering (45 days), Dhanashakti was 7 cm taller than ICTP 8203, which could have contributed to its higher stover yield. Limited testing showed that both varieties were equally and highly resistant to downy mildew, and Dhanashakti had slightly better resistance to blast and rust.

Considering its superior performance with respect to Fe content as well as grain and dry stover yields, Dhanashakti was released and notified wide SO 1146(E) dated 24 April 2014 for cultivation in the states of Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu, Rajasthan, Gujarat, Haryana, Uttar Pradesh and Delhi.

Dhanashakti is identified by its major distinguishing features such as large, globular and dark grey grains; compact to semi-compact and cylindrical-lanceolate panicles with shining outer surfaces of the grains; purple pigmentation of the glumes, mixed anther colour (mostly purple and some cream colour); anthocyanin pigmentation of the first leaf sheath; and mixed node pigmentation (mostly purple, but some green). These characteristics are similar to those of the ICTP 8203.

Commercial production of Dhanashakti was initiated by Nirmal Seeds Company, marketing its Truthfully Labelled Seeds under the brand name ICTP 8203 Fe, and reaching 25,000 farmers in Maharashtra in 2012. In 2013, Nirmal Seeds Company marketed this variety to 35,000 farmers. Dhanashakti being superior to ICTP 8203 for Fe density as well as for

grain yield, and similar to ICTP 8203 for other traits, it will find a ready place in farmers' field in states where ICTP 8203 has been adopted at wider scale. Dhanashakti is also included in the Nutri-Farm Pilot Project for addressing Fe deficiency.

With the official release, Dhanashakti now can be produced by public-sector seed agencies for which adequate quantities of breeder seed can be obtained from ICRISAT and MPKV, Rahuri.

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Desi Chickpea

Variety GNG 1958 (Marudhar)

Marudhar (GNG 1958) is a desi chickpea (*Cicer arietinum* L.) variety developed by Agricultural Research Station (SK Rajasthan Agricultural University), Sriganganagar for irrigated conditions of North West Rajasthan, Punjab, Haryana, Western Uttar Pradesh, Uttrakhand and Delhi. This variety was identified during Annual Chickpea Group Meet held at GB Pant University of Agriculture and Technology, Pantnagar (Uttrakhand) during September 1-3, 2012. This variety was notified by Central Sub Committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops, Ministry of Agriculture, Govt. of India vide Notification No. S.O. 952 (E) dated 10.04.2013. The variety Marudhar has been developed through pedigree selection from the multiple cross between GNG 1365 (GNG 798 x GNG 968) and SAKI 9516 (ICCC 42 x ICCV 10). This variety was tested in station trial during 2008-09 and Adaptive Trial Centres during 2010-11 in which it gave 16.2, 20.9 and 50.0 percent higher grain yield over check varieties GNG 1581, GNG 469 and BG 256 respectively. It was inducted for multilocation testing in Initial Varietal Trial (IVT) during 2009-10 in the name of GNG 1958 and subsequently tested in 23 trials conducted over 8 locations of North West Plain Zone of India during