IDT8-081 | Differential effect of AMF (*Glomus intraradices*) and endophytic fungus (*Piriformospora indica*) on finger millet [*Eleusine coracana* (L.) Gaertn] under the drought stress

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The aim of this work was to investigate the impact of AMF (*G. intraradices*) and endophytic fungus (*P. indica)* on the growth of finger millet plant under drought stress. Plant growth parameters such as leaf water status, chlorophyll content, malondialdehyde (MDA) content, electrolyte leakage, enzymatic (catalase CAT, superoxide dismutase SOD, guaicol peroxidase G-POX and polyphenol oxidase PPO), non-enzymatic antioxidants (ascorbic acid, glutathione, total phenols and flavonoids), and osmolytes (proline and total soluble sugars) were studied in pot culture under three soil moisture regimes (well-watered, moderate, and severe stress). Fungal-inoculated seedlings showed better growth as compared to non-inoculated plants. AM fungus was found to be more efficient in alleviating the detrimental effect of water stress by improving the plant biomass and growth characteristics. *P. indica*- inoculated plants have higher proline, relative water content and photosynthetic content under severe stress. Total soluble sugars accumulated more in AM-inoculated seedlings. Consequently, mycorrhiza-treated plants showed lower accumulation of ions, MDA and H_2O_2 at all stress levels. Secondary metabolites (phenol, flavonoid) and ascorbate-glutathione redox status was improved in *P. indica* treatments. AM fungus was more efficient in improving the antioxidant enzymatic activity under water stress condition, except *P. indica* showing their positive effects in improving the PPO activity under drought stress.

In conclusion, our findings indicated that inoculation with both of these fungi increased water stress tolerance of finger millet plant through a stronger antioxidant defence system. But both of the fungi may differ in their drought stress tolerance mechanisms.

IDT8-082 | Prospects of new chickpea varieties in Andhra Pradesh

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Andhra Pradesh is an important chickpea growing state in southern India, with spectacular increase in chickpea area from 120,000 ha in 1997/98 to 638,000 ha in 2007/08. The chickpea revolution in Andhra Pradesh has improved the prospects of many resource-poor, small land holding and rainfed farmers of Andhra Pradesh. However, the growing season of chickpea in Andhra Pradesh is warm and short (90-110 days), and drought is the foremost factor responsible for significant yield losses. Rainfall in major chickpea-growing regions is quite uncertain and erratic, resulting in poor yields. The Regional Agricultural Research Station of Acharya N G Ranga Agricultural University, Nandyal, Andhra Pradesh, India is the lead centre responsible for location-specific research in chickpea in Andhra Pradesh. With support from ICRISAT and ICAR, the centre has initiated crop improvement programmes during 2004 and has released four promising chickpea varieties for commercial cultivation. Three *desi* varieties viz., *Nandyal Sanaga* 1(NBeG 3), *Dheera* (NBeG 47), and *Nandyal Gram 49* (NBeG 49) released for Andhra Pradesh and one large-seeded *kabuli Nandyal Gram 119* (NBeG 119) released for the southern zone comprising Andhra Pradesh, Karnataka and Tamil Nadu, are cutting across chickpea growing regions of Andhra Pradesh. *Nandyal Sanaga 1*, released in 2012, is a bold-seeded *desi* variety tolerant to drought and heat; *Dheera* released during 2015 is also a *desi* variety and the first of its kind in India, suitable for mechanical harvesting. *Nandyal Gram 49* released during 2016 is a high-yielding *desi* variety with attractive seeds; whereas *Nandyal Gram 119* is early bold-seeded *kabuli* variety released during 2015. These varieties have clearly demonstrated their advantage (10%-15 % increase over popular varieties of the tract) in farmers' holdings in large-scale demonstrations and are being preferred by farmers of not only Andhra Pradesh, but also Karnataka, Tamil Nadu, Odisha and Maharastra. Efforts are underway to promote large-scale adoption of these varieties to maximize long term productivity of chickpeas in rainfed vertisols.