



Original Research Article

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Response of Indian mustard to Nutrients and Plant Growth Regulators: The Influence on Yield, Available Soil P Balance and P Recycling through Residues

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ABSTRACT

Poor oilseed productivity linked huge edible oil import by India are intimately interlinked and critically relate to over exploitation of agricultural soils, inadequate and imbalanced fertilization, restricted use of manures, residues and bio-fertilizers, unfavourable climatic conditions and physiological and genetic constraints associated with oilseeds. Plant growth regulators (PGRs) mitigate a variety of abiotic and biotic stresses and a strong synergistic interaction between auxins and brassinosteroids (BRs) is also widely reported but commercial exploitation of this interaction has yet not been attempted in actual field studies. Therefore, eight nutrient treatments comprising of 75 and 100% recommended dose of fertilizers (RDF) and their combinations with 5 t farm yard manure ha⁻¹(FYM), bio-fertilizers (*Azotobacter* + PSB) and FYM + bio-fertilizers as well as four PGRs (water spray, brassinolide/BR 0.5 ppm, Indole 3 acetic acid/IAA 50 ppm and BR 0.5 + IAA 50 ppm) were evaluated on medium clay loam soils of Udaipur during winters of 2012 and 2013 in a split plot design replicated thrice. Results illustrate that among nutrient treatments, 100% RDF + FYM + bio-fertilizers registered significantly higher pooled seed and stover yield (3231 and 13604 kg ha⁻¹, respectively), crop phosphorus uptake (52.71 kg ha⁻¹), available soil P at crop harvest (23.35 kg ha⁻¹), gain in available soil P (3.21 kg ha⁻¹) and dry biomass of residues (4649.1 kg ha⁻¹) and Precycled (11.56 kg ha⁻¹). Out of PGRs, BR + IAA recorded significantly higher pooled seed and stover yield (2922 and 12379 kg ha⁻¹, respectively), crop phosphorus uptake (47.12 kg ha⁻¹), dry biomass of residues (4186.9 kg ha⁻¹) and Precycled (10.44 kg ha⁻¹).

Keywords

Available soil P, Indian mustard, Plant growth regulator, Residue recycling, Soil phosphorus balance.

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