Research Article

BALANCE SHEET OF N AND S RECYCLING AND PRODUCTIVITY OF INDIAN MUSTARD UNDER DIFFERENT NUTRIENT TREATMENTS AND PLANT GROWTH REGULATORS

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Abstract: Oilsed productivity in the country is being constrained by shrinking soil fertility, inadequate and imbalanced fertilization and climatic constraints. PGRs mitigate abiotic and biotic stress and a number of laboratory/pot culture studies confirm to a strong synergistic interaction between auxins and brassinosteroids/BR but field studies in this line are meager. Therefore, N and S dynamics mainly soil depletions, crop uptake and unaccounted losses were studied through balance sheet method under different nutrient treatments and plant growth regulators/PGRs to achieve sustained higher productivity of Indian mustard during winters of 2012 and 2013 in Udaipur region. Eight nutrient treatments i.e. 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 in main plots and four PGRs (water spray, BR 0.5 ppm, Indole acetic acid/IAA 50 ppm and BR 0.5 + IAA 50 ppm) in sub plots were evaluated in a split plot design replicated thrice. Results show that 100% RDF + FYM + bio-fertilizers outperformed other nutrient treatments in pooled seed and stover yield (3231 and 13604 kg ha⁻¹), crop N and S uptake (157.23 and 79.43 kg ha⁻¹, respectively) and available soil N and S at crop harvest (272.53 and 25.44 kg ha⁻¹, respectively). Among PGRs, BR + IAA registered significantly higher pooled seed yield (130.01 and 123.09 kg ha⁻¹) and crop N and S uptake (142.11 and 69.52 kg ha⁻¹, respectively).

Keywords: Brassinolide, Indole acetic acid, Indian mustard, integrated nutrient management, Rice straw recycling.