



## RESPONSES OF ORGANIC MANURES AND BIO-FERTILIZERS ON GROWTH AND YIELD OF ASHWAGANDHA (*WITHANIA SOMNIFERA* L. DUNAL)

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**ABSTRACT:** The present field investigation was carried out at Department of Plantation, Spices, Medicinal and Aromatic Crops, College of Horticulture, Mandsaur, under RVKSVV, Gwalior (M.P.) during the year 2021-2022 in RBD Design with three replications. In this experiment the plots of individual treatments were applied in different levels of FYM, vermicompost, neem cake, castor cake and in combination with bio-fertilizers (PSB, *Azotobactor* and *Azospirillum*) with a control plot in Ashwagandha (JA 134). Results revealed that treatment T<sub>3</sub> - VC at 6t ha<sup>-1</sup> + BF at 2 kg ha<sup>-1</sup> had highest plant height (44.64 cm), number of leaves (153.64 plant<sup>-1</sup>), number of branches (9.52 plant<sup>-1</sup>), fresh weight (107.73 g plant<sup>-1</sup>) and dry weight (33.33 g plant<sup>-1</sup>). Among the growth observations, leaf area index (0.93, 3.14, 5.28, 6.54 and 6.73), leaf area duration (83.53, 282.53, 474.86, 588.86 and 606.06 cm<sup>2</sup> day<sup>-1</sup>), crop growth rate (0.046, 0.249, 0.076, 0.026 and 0.024 g cm<sup>2</sup> day<sup>-1</sup>) and relative growth rate (0.047, 0.115, 0.063, 0.029 and 0.025 g g<sup>-1</sup> day<sup>-1</sup>) at 30-60, 60-90, 90-120, 120-150 DAS and 150 DAS-harvest respectively in T<sub>3</sub> - VC at 6t ha<sup>-1</sup> + BF at 2 kg ha<sup>-1</sup>. Moreover, the maximum number of berries (120.43), root girth (13.45), shoot girth (15.70), root length (21.32), root shoot ratio by weight (0.529), seed yield (8.15) and fresh root yield (21.09) found in treatment T<sub>3</sub>-VC at 6t ha<sup>-1</sup>+ BF at 2 kg ha<sup>-1</sup> also gross return (Rs. 201600), net return (Rs. 147000) and benefit: cost ratio (2.5) while cost of cultivation (Rs. 56600) in T<sub>9</sub>-CC at 2t ha<sup>-1</sup> + BF at 2 kg ha<sup>-1</sup>.

**Keywords:** Bio-Fertilizers, growth, organic manures, *Withania somnifera*, yield

**Citation:** Garwal PS, Meena KC, Soni N, Patidar DK, Kachouli BK, Patidar BK, Haldar A (2023) Responses of organic manures and bio-fertilizers on growth and yield of Ashwagandha (*Withania somnifera* L. Dunal). Indian J Trop Biodiv 31(1): 24-30.

### INTRODUCTION

Ashwagandha is a major dry land medicinal plant of Solanaceae family and used in the traditional

Indian medicine since long times. The plant grows erect to height of 35-75 cm having small green-coloured flowers and orange-red ripe fruit. It is