

Humic Acid and Azadirachtin Derivatives for the Management of Crop Pests

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Abstract : Organic cultivation of crops is gaining importance consumer awareness towards pesticide residue free foodstuffs is increasing globally. This is also because of high costs of synthetic fertilizers and pesticides, making the conventional farming non-remunerative. In India, organic manures (such as vermicompost) are an important input in organic agriculture. Though vermicompost obtained through earthworm and microbe-mediated processes is known to comprise most of the crop nutrients, but they are in small amounts thus necessitating enrichment of nutrients so that crop nourishment is complete. Another characteristic of organic manures is that the pest infestations are kept under check due to induced resistance put up by the crop plants. In the present investigation, deoiled neem cake containing azadirachtin, copper ore tailings (COT), a source of micro-nutrients and microbial consortia were added for enrichment of vermicompost. Neem cake is a by-product obtained during the process of oil extraction from neem plant seeds. Three enriched vermicompost blends were prepared using vermicompost (at 70, 65 and 60%), deoiled neem cake (25, 30 and 35%), microbial consortia and COTwastes (5%). Enriched vermicompost was thoroughly mixed, moistened (25+5%), packed and incubated for 15 days at room temperature. In the crop response studies, the field trials on chili (*Capsicum annum* var. longum) and soybean, (*Glycine max* cv JS 335) were conducted during Kharif 2015 at the Main Agricultural Research Station, UAS, Dharwad-Karnataka, India. The vermicompost blend enriched with neem cake (known to possess higher amounts of nutrients) and vermicompost were applied to the crops and at two dosages and at two intervals of crop cycle (at sowing and 30 days after sowing) as per the treatment plan along with 50% recommended dose of fertilizer (RDF). 10 plants selected randomly in each plot were studied for pest density and plant damage. At maturity, crops were harvested, and the yields were recorded as per the treatments, and the data were analyzed using appropriate statistical tools and procedures. In the crops, chili and soybean, crop nourishment with neem enriched vermicompost reduced insect density and plant damage significantly compared to other treatments. These treatments registered as much yield (16.7 to 19.9 q/ha) as that realized in conventional chemical control (18.2 q/ha) in soybean, while 72 to 77 q/ha of green chili was harvested in the same treatments, being comparable to the chemical control (74 q/ha). The yield superiority of the treatments was of the order neem enriched vermicompost>conventional chemical control>neem cake>vermicompost>untreated control. The significant features of the result are that it reduces use of inorganic manures by 50% and synthetic chemical insecticides by 100%.

Keywords : humic acid, azadirachtin, vermicompost, insect-pest

Conference Title : ICCPC 2017 : International Conference on Crop Production and Chemicals

Conference Location : Melbourne, Australia

Conference Dates : November 29-30, 2017