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Suppression of Cotton Bacterial Blight (*Xanthomonas campestris* pv. *malvacearum*) by Compost and Vermicompost

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Abstract

Environmental pollution with pesticides and fertilisers is one of the world challenges. It is a common knowledge that burning the residues of these chemicals produces toxic compounds which disperse either as aerosols, especially during insufficient incineration, or remains associated with the soil or leach out into the water. These compounds are deleterious and are recycled over and over again in the environment. The implementation of integrated solutions has been suggested to minimise these problems. About 200,000 tons of cotton and 500,000 tons per hectare of wheat and tons of other crops residues are annually burnt in the irrigated schemes of Gezira-Managil, Sudan. In particular cotton residues must be collected and quick burnt in order to prevent spread of residue-borne diseases such as bacterial blight (blackarm disease) which exacerbate up to 35% loss in the productivity. Few studies have investigated the suppression of the soil-borne plant pathogen by vermicompost therefore, the study aimed to evaluate the potential of compost and vermicompost as possible alternatives to mitigate or suppress the pathogen survival using semi-selective media. Infected cotton residue was used to study the fate of the pathogen during these processes. The results showed that the pathogen colonies number was high in the first sampling date (first month) and progressively decreased with the subsequent sampling dates (up to the end of the experiment) ($p < 0.0001$). The highest pathogen number was in the control and the lowest in the vermicompost followed by compost and the interaction between time and treatment was also significant ($p < 0.0001$). The study revealed that the pathogen was significantly suppressed and treatments are invariably beneficial.

Keywords: Bacterial blight, blackarm disease, compost and vermicompost, cotton residue, semi-selective media