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Persistence and degradation of propineb in soil

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SUMMARY

A laboratory experiment was conducted to study the persistence and degradation of propineb in soils from Malur and Hassan (sandy clay loamy) at 25 and 50 µg g^{-1} with field capacity and half-field capacity moisture regimes. The degradation pattern followed the first order kinetics. Degradation of propineb was faster under field capacity than half-field capacity moisture regimes at both rates in both the soils. Higher degradation was noticed in Malur soil than Hassan soil at both the rates of application and moisture regimes. The half-life values ranged from 6.5 to 7.1 days for Malur soil and 6.9 to 7.1 days for Hassan soil when applied at 25 and 50 µg g^{-1} of propineb under field capacity. Under half-field capacity the half-life ranged from 7.1 to 7.9 days for Malur soil and 9.1 and 9.8 days when applied at 25 and 50 µg g^{-1} of propineb, respectively.

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KEY WORDS : Persistence, Degradation, Propineb, Sandy clay loam

Potato (*Solanum tuberosum* L.) is one of the prime remunerative crop of southern Karnataka, which are mainly attacked by several fungal diseases. Research recommendations of chemical control of pest are considered as incomplete if data on toxic residue of pesticides are not available. Antracol 70WP (Propineb) is a newly introduced broad spectrum contact dithiocarbamate fungicide (Polymeric) in Indian market by Bayer (India). It is also called as methylzineb or mezineb or LH 30/Z or Bay 46131. Its closely related compounds are zineb, mancozeb, metiram, etc., which contain zinc in their structure. Propineb, PBDC (Propylene bis dithiocarbamate), a propylene analogue of zineb, has moderate acute toxicity. It degrades to propylene thiourea (PTU) in the environment. It is used as a protective treatment on several crops for the control of various fungi belonging especially to Oomycetes, Ascomycetes, Basidiomycetes and Fungi imperfect. Propineb controls blight on potatoes and tomatoes, downy mildew on hops and vines, apple scab, blue mould on tobacco and sigatoka disease of banana. It can also be used on gooseberries, black currants, celery and cereals to control many fungal diseases. Propineb [polymeric zinc propylene-bis-(dithiocarbamate)] $[(C_5H_8N_2S_4Zn)_x]$ is a polymeric dithiocarbamate fungicide. A new, commercially available fungicide formulation, propineb 70 per cent WP, which belongs to the group of propylene-bis-dithiocarbamates, can be used as a substitute for the control of several fungal diseases of potato. It is widely used as foliar application against blight disease of potato, tomato and paddy. Present investigation was under taken to evaluate the persistence and degradation pattern of propineb in two soils of potato growing areas of Karnataka.

EXPERIMENTAL METHODS

The experiment on the influence of moisture regimes (field capacity and half field capacity) and rate of application (25 and 50 µg g^{-1}) on the persistence and degradation of propineb was studied in two (Malur and Hassan) potato growing soils of Karnataka with sandy

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