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Short communication

Persistence and dissipation of triazophos in bitter gourd

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ABSTRACT

Triazophos (Trazan 40 EC) @ 0.06% a.i. (1.5 ml/lt. of water) and 0.12% a.i. (3 ml/lt. of water) were sprayed on bitter gourd at fruiting stage during kharif, 2003. First spray was done at 45 days after sowing and next at 15 days after first spraying. Fruit samples for residue estimation were collected after second application of pesticide. The maximum initial residue of 0.31 and 0.79 ppm were recorded after 2 h of second spray. No residue could be detected after 7 days following application at 0.06% a.i./ha and after 15 days of spraying following spray at double the recommended dose. Half-life values of Triazophos used @ 0.06% and 0.12% a.i. were found to be 0.75 and 1.55 days, respectively.

Key words : Bitter gourd, Triazophos, Residue, Half-life

Bitter gourd (*Momordica charantia* L.) or 'Karela' is considered to be native to tropical Asia, particularly eastern India and southern China. *Bactrocera cucurbitae* Coq., commonly known as melon fly, is highly polyphagous and it's preferred hosts are bitter gourd, musk melon, snap melon, and snake gourd (Srivastava and Butani, 1998). In bitter gourd, this pest causes upto 60% yield losses (Fischer and Busch, 1989). Various insecticidal schedules have been tested against this important pest throughout the country. In a field trial conducted at Hyderabad, Reddy (1997) reported the pesticide triazophos to be one of the most effective against this pest. The present study was, therefore, undertaken to determine dissipation of triazophos residue in bitter gourd fruit, for evaluation of safety in applying it.

The experiment was carried out during June-October, 2003 at the University Research Farm, Bidhan Chandra Krishi Viswavidyalaya, Kalyani, Nadia, West Bengal in a Randomized Block Design with the variety *Meghna*. The crop sown on 30.06.2003 was raised following recommended agronomic practices. The treatments were: triazophos (Tarzan 40EC) @ 0.06% a.i. (1.5 ml/lt. of water), 0.12% a.i. (3 ml/lt. of water) with an untreated control, replicated thrice, with a plot size of 15 m x 7.5 m. Triazophos was sprayed twice, first at 45 days from sowing and the second at 15 days from the first spray. Fruit samples were collected randomly from treated and untreated plots at 0 (2 h), 1, 3, 7 and 15 days after second application of the pesticide. Finely chopped 50 g sample was of the fruit was blended using 100 ml distilled acetone in a Remi-automix blender for 3-4 minutes.

Extracts were then filtered through a Buchner funnel using 150 ml acetone. The combined titrate was concentrated in a rotary vacuum evaporator to 5-6 ml. The filtrate was then partitioned thrice with dichloro methane (50 ml x 3). The combined dichloro methane extract was dried over anhydrous sodium sulphate and evaporated using a rotary vacuum evaporator to concentrate it. The residue was subjected to column clean-up using activated charcoal : celite : neutral alumina (2:2:1). The column was eluted with dichloro methane : n-hexane (9:1) and evaporated to dryness. Finally, the volume was made upto 5 ml with distilled hexane. The residue was finally estimated using GLC equipped with flame photometric detector (FPD). The detector, the column and the injection temperatures were 250, 210 and 220°C, respectively. Retention time for triazophos was 6.1 minutes. Flow rates of hydrogen, nitrogen and air was 20 ml/min., 5 ml/min. and 50 ml/min., respectively.

Data relating to residual fate and persistence, as well as, dissipation pattern of triazophos in bitter gourd

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Table 1. Residues of triazophos in bitter gourd fruit

Days after second spray	Residue(ppm)			
	0.06% a.i.		0.12% a.i.	
	Mean residue level(range)	%Dissipation	Mean residue level(range)	%Dissipation
0	0.31(0.25-0.37)	-	0.79(0.71-0.85)	-
1	0.16(0.13-0.21)	48.39	0.33(0.31-0.35)	58.23
3	0.02(0.01-0.04)	93.55	0.10(0.09-012)	87.34
7	BDL	100	0.03(0.03-0.04)	96.20
15	BDL	100	BDL	100
Regression equation (r-value)	-	Y= 2.54 – 0.40 x(-0.995)	-	Y= 2.76 – 0.19 x(-0.974)
Half-life (RL 50) days	-	0.75	-	1.55

BDL- Below detectable level
Limit of detection <0.01 µg/g

fruit have been summarized in Table 1. This indicates that two sprays of triazophos @ 0.06 and 0.12 % a.i./ha recorded a residue of 0.31 and 0.79 mg/kg, respectively, at zero days, which was above MRL (0.1-0.2 mg/kg) which dissipated to BDL and 0.03 mg/kg, respectively, at 7 days after the second spray. After one day, the average residues remaining were 0.16 ppm and 0.33 ppm, showing 43.39% and 58.23% dissipation, respectively. Thereafter, triazophos residue declined to 0.10 and 0.02 ppm showing a reduction of 87.34% and 93.55%, respectively. No residue could be detected after 7 days in the case of T1, while, it was so after a lapse of 15 days for T2. Dissipation rate followed first order reaction kinetics. Correlation coefficient was significant (0.995 and 0.974, respectively), which indicated statistical conformity of dissipation data to first order kinetics. Half-life values (RL 50 or T1/2) were found to be 0.75 (T1) and 1.55 (T2). This was in agreement with those reported for triazophos residues in brinjal (Raj *et al*, 1999; Reddy *et al*, 2001). Thus, from the half-life values calculated, it could be deduced that the compound was of very low persistence. It is known that the potential of a pesticide to contaminate vegetables and other foods increases with increasing mobility and half-life. Thus, this insecticide can be safely used in bitter gourd at the doses mentioned.

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