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Processing factor for selective insecticides in chilli

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Abstract
The present processing factor study was carried out at All India Network Project on Pesticide Residues, Rajendranagar, Hyderabad during *kharif* 2015-16. The processing factors for test insecticides *viz.*, fipronil at 500 g a.i. ha^{-1}, spinosad at 125 g a.i. ha^{-1}, chlorantraniliprole at 30 g a.i. ha^{-1}, profenophos at 400 g a.i. ha^{-1}, lambda cyhalothrin15.63 g a.i. ha^{-1}, imidacloprid (betacyfluthrin + imidacloprid at 30 g a.i. ha^{-1}), betacyfluthrin (betacyfluthrin + imidacloprid at 30 g a.i. ha^{-1}) and dimethoate at 300 g a.i. ha^{-1} were 2.77, 1.50, 2.36, 3.01, 2.44, 2.39, 2.83 and 3.20, respectively.

Keywords: Chilli, processing factor, insecticides

1. Introduction
Chilli (*Capsicum annum* L.), is an important vegetable and condiment crop grown throughout the world. A number of pesticides are being frequently used, to combat the pests. However, some of these insecticides leave residues on pods and these residues may persist up to harvest. Presence of pesticide residues in the harvested chillies was posing problem at the time of export and in recent times importing countries have rejected few consignments. Pesticide use has increased rapidly over the last two decades at the rate of 12 per cent per year (Thacker et al., 2005) [6]. As per insecticides Act of 1968 (www.cibrc.nic.in) [7], 37 insecticide formulations are registered and recommended for use on chilli targeting various pests. Indiscriminate use of synthetic pesticides causes severe ecological consequences like destruction of natural enemy fauna, effect on non-target organisms, secondary pest outbreaks. In addition it leads to pesticide residues in food and contaminates the environment which may lead to deleterious impacts not only on human health, but also on other biota (Sreelatha and Diwakar, 1997) [5]. The cultivators impressed by the apparent advantages of these insecticides are using such chemicals indiscriminately without caring for ill effects. The extensive and irrational use of pesticides for control of pests resulted in the presence of residues of insecticides on chilli is likely to be associated with severe effects on human health. Sometimes, processing of chilli leads to increase in the concentration of the pesticides in final product. Hence, in view of the possible residue problems posed by these chemicals to the consumers, this study was taken up to find out the magnitude of increase in concentration of these insecticides (processing factor) in processed chilli so as to prescribe the suitable processing factor for chilli.

2. Materials and Methods
The seven insecticides viz., Fipronil, Spinosad, Chlorantraniliprole, Profenophos, Lambdacyhalothrin, Betacyfluthrin + imidacloprid (soloman), Dimethoate and control (water spray) were sprayed as per the dosages at red chilli stage of the crop and samples were collected immediately after spray. Insecticide residues were estimated from the fresh samples from each replicated treatment. Then the left over sample was shade dried and powdered. Then the insecticide residues of all the treatments were estimated from the red chilli powder. The processing factor was worked out by using the formula.
Processing factor = residues in chilli powder / residues in fresh sample

3. Results and Discussion
The red chilli samples were collected from various plots treated with fipronil 5% SC @ 500 g a.i ha^{-1}, spinosad 45% SC @ 125 g a.i ha^{-1}, chlorantraniliprole 20% SC@ 30 g a.i ha^{-1}, profenophos 50% EC @ 400 g a.i ha^{-1}, lambda cyhalothrin 5% SC @ 15.63 g a.i ha^{-1}, imidacloprid + beta cyfluthrin 300% OD @ 30 g a.i ha^{-1}and dimethoate 30% EC@ 300 g a.i

ha^{-1} at harvest to estimate initial deposits and residues in sundried red chilli powder. After estimating the residues from red chilli and powdered chilli, the processing factor was calculated.

The results of the experiment revealed that respective initial deposits of fipronil, spinosad, chlorantraniliprole, profenophos, lambdacyhalothrin, imidacloprid, betacyfluthrin and dimethoate in fresh red chilli were 1.71, 0.80, 0.96, 3.14, 1.34, 1.28, 0.36, 3.97 mg kg^{-1}, whereas in sundried red chilli powder were 4.74, 1.20, 2.27, 9.46, 3.27, 3.06, 1.02 and 12.72 mg kg^{-1} (Table 1 & Fig. 1). In case of control, none of these pesticide residues were detected. The processing factors computed for fipronil, spinosad, chlorantraniliprole, profenophos, lambdacyhalothrin, imidacloprid, betacyfluthrin and dimethoate were 2.77, 1.50, 2.36, 3.01, 2.44, 2.39, 2.83 and 3.20, respectively. The results revealed that by reducing the weight after dehydration of the fresh chilli, the concentration of the pesticides increased to 2.77, 1.50, 2.36, 3.01, 2.44, 2.39, 2.83 and 3.20, respectively. Similar results were also reported in a field experiment by Pathan *et al.* (2009) [3] who reported that the processing factor for dicofol (18.5 EC), ethion (50 EC) and cypermethrin (25 EC) in chilli were 5.59, 3.52 and 7.50, respectively. Similarly Shah *et al.* (2009) [4] find out processing factor for the chlorthalonil, chlorpyriphos and endosulfan in turmeric were 2.3, 0.6 and 4.7, respectively.

George and kumar (2013) [1] reported the processing factor for chlorpyriphos and lambda cyhalothrin were 3.24 and 2.98, respectively in cardamom, while, Pan *et al.* (2015) [2] reported the processing factors of dimethoate were in the range of 2.11–2.41 and 1.41–1.70 during green tea and black tea manufacturing, respectively.

Table 1: Processing factor for selective insecticides in chilli

Insecticides	Residues (mg kg^{-1})		Processing factor
	Red chilli	Sundried red chilli powder	
Fipronil	1.71	4.74	2.77
Spinosad	0.80	1.20	1.50
Chlorantraniliprole	0.96	2.27	2.36
Profenophos	3.14	9.46	3.01
Lambda-cyhalothrin	1.34	3.27	2.44
Imidacloprid	1.28	3.06	2.39
Betacyfluthrin	0.36	1.02	2.83
Dimethoate	3.97	12.72	3.20

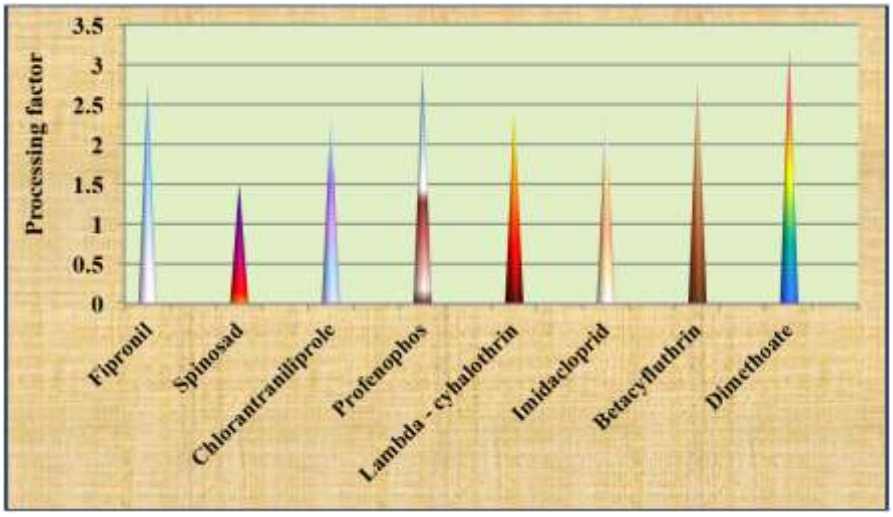

Fig 1: Processing factor for selective insecticides in chilli

4. Conclusion

The processing factors for test insecticides *viz.*, fipronil at 500 g a.i. ha^{-1}, spinosad at 125 g a.i. ha^{-1}, chlorantraniliprole at 30 g a.i. ha^{-1}, profenophos at 400 g a.i. ha^{-1}, lambda cyhalothrin15.63 g a.i. ha^{-1}, imidacloprid (betacyfluthrin + imidacloprid at 30 g a.i. ha^{-1}), betacyfluthrin (betacyfluthrin + imidacloprid at 30 g a.i. ha^{-1}) and dimethoate at 300 g a.i. ha^{-1} were 2.77, 1.50, 2.36, 3.01, 2.44, 2.39, 2.83 and 3.20, respectively.

5. References

1. George T, Kumar NP. Residue estimation of chlorpyriphos and lambda cyhalothrin in cardamom [*Elettaria cardamomum* (L.) Maton] Journal of Spices and Aromatic Crops. 2013;22(1):65-69.
2. Pan R, Chen HP, Zhang ML, Wang QH, Jiang Y, Liu X. Dissipation Pattern, Processing Factors, and Safety Evaluation for Dimethoate and Its Metabolite (Omethoate) in Tea (*Camellia Sinensis*). PLoS ONE. 2015;10(9):0138309.
3. Pathan ARK, Parihar NS, Sharma BN. Effect of drying on the residues of dicofol, ethion and cypermethrin in chilli (*Capsicum annum* L.). Pest Management in Horticultural Ecosystems. 2009;15(2):167-169.
4. Shah PG, Kalpana D, Raj MF, Patel AR. Effect of processing of turmeric on chlorthalonil, chlorpyriphos and endosulfan. Pesticide Research Journal. 2009;21(1):86-88.
5. Sreelatha, N and Diwakar, B.J. Impact of imidacloprid seed treatment on insect pest incidence in okra. Indian

Journal Plant Protection. 1997; 25(1): 52-55.
6. Thacker NP, Bassin JK, Nitnaware V, Vaidya P, Das SK, Biswas M. Proceeding of the national seminar on pesticide residues and their risk assessment; c2005. p. 65-77.
7. www.Cibrc.nic.in