

## STUDIES ON BIO AND MODERN PESTICIDES FOR THE MANAGEMENT OF DIAMOND BACK MOTH, *PLUTELLA XYLOSTELLA* (LINN.) ON CAULIFLOWER

K.L. Painkra<sup>1\*</sup>, G.P. Painkra<sup>2</sup> and P.K. Bhagat<sup>3</sup>

Indira Gandhi Krishi Vishwavidyalaya, Rajmohini Devi College of Agriculture & Research Station,  
Ambikapur (Chhattisgarh) 497001 India  
Email: kanha\_igkv@rediffmail.com

Received-05.05.2016, Revised-25.05.2016

**Abstract:** The present study was undertaken the most effective as well as economical viable insecticide for the control of diamond-back moth *Plutella xylostella* L. on cauliflower. One bio-pesticide i.e. *Bacillus thuringiensis* (WP) and six modern insecticides i.e. Imidacloprid (17.8% SL), Acetamiprid (20% SP), Thiomethoxam (25% WG), Fipronil (5% SC), Cartap hydrochlorid (50% SP) and PII-0111 (20% WDG) with an adjuvant "Chipco" were tested against the diamond back moth under natural field condition. In all two sprays were applied in morning hours when the pest attained a desired level of larval population. The result indicated that all the treatments were superior to the control in reducing the larval population of DBM after both applications of the sprays. After the first and second sprays fipronil proved to be the most effective and also gave significantly higher yield as compared with other treatments. The next effective treatment was cartap hydrochloride, which also gave significant reduction in the larval population after first and second sprayings. It also gave better yield and higher per cent increase in yield over control. Other treatments, i.e., PII-0111, thiomethoxam, acetamiprid, imidacloprid and *Bacillus thuringiensis*, were least effective.

**Keywords:** Cauliflower, Pesticides, Management, Population

### REFERENCES

- Anonymous** (2002). *Economic Survey of Govt. of India*, 2001-02, p.191.
- Chelliah, S. and Srinivasan, K.** (1986). Bioecology and management of diamond back moth in India. In *Diamond- back moth management. In : Proceeding of the First International Workshop*, Tainan, Taiwan, 11-15 March, 1985; p. 63-76.
- Choudhary, B. S. and Rawat, R. R.** (1967). Survey of insect pest of crucifer and bionomics of diamondback moth, *Plutella xylostella*. *M. Sc. (Ag.) Thesis, Department of Entomology, JNKVV. Jabalpur (M.P.)*, P. 20-45.
- CIE**, (1967). *Distribution Maps of Pests-Map*. No. 32 (Revised), Commonwealth Institute of Entomology, London, U.K.
- Devjam, P. and Singh, T. K.** (1999). Field density and biology of diamondback moth on cauliflower in Manipur. *J. Adv. Zool.*, **20** (1):53-55.
- Fletcher, T.B.** (1914). *Some South Indian Insects*. Supdt. Govt. Press, Madras, p. 565.
- Hill, O. S.** (1975). Agricultural insect pests of the tropics and their control. *Cambridge University Press*. p. 61-78.
- Joia, B. S., Udeaan, A. S. and Chawla, R. P.** (1994). Laboratory evaluation of cartap hydrochloride, an alternative promising insecticide against multi-resistant populations of diamondback moth in Punjab. *Natl. Symp. on Emerging Trends in Pest Management*, Solan, 28-30 June, 1994.
- Joshi, N. R. and Jhala, R.C.** (1999). Field evaluation of different synthetic and bio-pesticides against diamondback moth, *Plutella xylostella* (L.) on cress (*Lepidium sativum* L.). *Neem Newsletter*, **16**(3): 26.
- Khaire, V. A., Lawande, K. E., Ajri, D. S. and Kale, P. N.** (1987). Occurrence of insect pests on different cauliflower cultivars. *Current Research Reporter, Mahatma Phule Agricultural University*, **2** (2): 205-208.
- Lee, H. S.** (1986). Seasonal occurrence of the important insect pests on cabbage in Southern Taiwan. *J. Agric. Res. China*, **35**(9): 530-542.
- Lim, G. S.** (1996). Integrated Pest Management in Developing Countries. In : G.J. Persley (ed.), *Biotechnology and Integrated Pest Management*. CAB International, Wallingford, U.K., p. 61-75.
- Liu, M.Y., Tzeng, Y. J. and Sun, C. N.** (1981). Diamondback moth resistance to several synthetic pyrethroids. *J. Econ. Entomol.*, **74**: 393-396.
- Mehrotra, K. N.** (1993). Status of insecticides resistance in insect pest. In : G.S. Dhaliwal and B. Singh, eds., *Pesticides: their Ecological Impact in Developing Countries*. Common wealth Publisher, New Delhi, India. 30-50.
- Nagesh, M. and Verma, S.** (1997). Bio-efficacy of certain insecticides against diamond back moth, *Plutella xylostella* on cabbage. *Indian J. Ent.* **59** (40): 411-414.
- Nawrocka, B.** (1986). Effectiveness of bacterial preparation and dimilin in the control of diamond-back moth, *Plutella xylostella* caterpillars.
- Noppuna, V., Saito, T. and Miyata, T.** (1986). Cuticular penetration and susceptible diamond-back moth *Plutella xylostella* L. *J. Pestic. Sci.*, **12**:85-89.
- NRI** (1991). *A Synopsis of Integrated Pest Management in Developing Countries in Tropics*. Natural Resources Institute, Chatham, U.K.

\*Corresponding Author

- Panda, S.K., Behera, U. K. and Nayak, S. K.** (1999). Bio-efficacy of fipronil 5% SC against diamond-back moth, *Plutella xylostella*(L.) (Yponomeutidae; Lepidoptera) infesting cabbage. *Insect Environment*, **5**(3): 104-105.
- Ravindra, R.J.; Justin, C.G.L. and Jayraj, S.** (1995). Relative susceptibility of two larval population of diamondback moth (*Plutella xylostella*) to insecticides and *Bacillus thuringiensis*. *Indian J. Agric. Sci.*, **65**(2) : 152-153.
- Rajavel, D. S. and Babu, P. C. S.** (1989). Studies on moult inhibitor and synthetic pyrethroids for control of cabbage diamondback moth, *Plutella xylostella* L. on cabbage. *Vegetable Science*, **16** (2): 201-204.
- Ridland , P.M. and Endersby, N. M.** (2011). Some Australian populations of diamondback moth, *Plutella xylostella* (L.) show reduced susceptibility to fipronil. The Six International Workshop on Management of diamond back moth and other crucifer insect pests. AVRDC – The World Vegetable Center ( Taiwan) pp 207-215.
- Sharma, S. S., Kalra, V. K. and Mrig, K. K.** (2000). Evaluation of different formulation of *Bacillus thuringiensis* var. *kurstaki* against *Plutella xylostella* (L.). *Annals of Agri. Bio. Res.* **5** (1): 67-70.
- Singh, S. P.** (1980). Studies on chemical control of diamondback moth, *Plutella xylostella* (L.) on cauliflower and its development on some cruciferous hosts. *M. Sc. Thesis*, PAU, Ludhiana.
- Srinivasan, K. and Krishnakumar, N. K.** (1982). Pest management in cabbage, In *Ann. Rep. Ind. Inst. Hort. Res.*, Bangalore, India. pp. 80-81.
- Sun, C. N., Chi, H. and Feng, N.T.** (1978). Diamondback moth resistance to diazinon and methomyl in Tiiwan. *J. Econ. Ent.*, **71** : 551-554.
- Takahashi, H., Mitsui, J. Yano, M., Take, T. and Yamada, T.** (1999). Efficacy of acetamiprid 2% granule against diamondback moth on cabbage by various application methods. *J. .Pestic. Sci.*, **24**(1): 23-27.
- Vishwakarma, R. K. and Pachori, R.** (2002). Management of diamondback moth, *P. xylostella* (L.) on cabbage. *M. Sc. Thesis*, Department of Entomology, JNKVV, Jabalpur (M.P.).
- Zhang, B.C.** (1994). Index of economically important Lepidoptera. University, Press Cambridge, pp. 404.