

## **Insecticides Make High Quality Eggplant (Brinjal) Production in India Possible**

*International Pesticide Benefits Case Study No. 54, May 2012*

*Leonard Gianessi and Ashley Williams*

Brinjal, also known as eggplant or aubergine, is native to India and has been cultivated in the country for over 4000 years. A total of 1.4 million small family farms grow brinjal on 550,000 hectares. It is an important cash crop for poor farmers, who transplant it from nurseries at different times of the year to produce two or three crops. Brinjal provides a steady stream of food for the family; it also provides a stable income from market sales for most of the year serving as a vehicle for reducing poverty in rural areas [1]. India produces 8 to 9 million tons, equivalent to one quarter of the global production.

The biggest threat to eggplant cultivation in India is the widespread infestation of eggplant shoot and fruit borer (ESFB) which can damage 95% of the crop during the rainy season [3]. ESFB is a tropical insect and predominately feeds on eggplant. It is widely prevalent in all brinjal growing states and is active all through the year in India [1]. It poses a serious problem because of its high reproductive potential. The number of eggs laid by an average female ESFB moth varies from 80 to 250 [4]. After hatching from eggs, young caterpillars bore into tender shoots, into flower buds or into the fruits. Larval feeding inside the fruit results in destruction of fruit tissue. The feeding tunnels are often clogged with excreta. This makes even slightly damaged fruit unfit for marketing [4].

Surveys of farmers have determined that nearly all of the brinjal hectares are sprayed with insecticides to prevent damage from ESFB [4]. Farmers spray insecticides to kill the larva before it enters the fruit [4]. The number of sprays on brinjal to control ESFB varies widely from 15 to 40 or more in a single crop season. As a result, farmers produce blemish free fruits, which command premium prices in the market [5]. Insect damaged fruit are fed to cattle [2]. Research has shown that insecticide usage can lead to doubling and quadrupling of brinjal yield [3]. The cost benefit ratio for insecticide use ranged between a minimum of 1:5 to a maximum of 1:20 [3].

To protect their eggplant crop, farmers have been relying on insecticides because alternative control measures have not been developed [6]. Several attempts have been made in South Asia to develop cultivars resistant to ESFB, but after 40 years of efforts, no commercial cultivar has been developed with an appreciable level of resistance [4].

### **References**

1. Choudhary, B. and K. Gaur. 2009. *The Development and Regulation of BT Brinjal in India*. ISAAA Brief 38.
2. Baral, K., et al. 2006. Socio-economic Parameters of Pesticide Use and Assessment of Impact of an IPM Strategy for the Control of Eggplant Fruit and Shoot Borer in West Bengal, India. AVRDC Technical Bulletin No. 37.
3. Abrol, D.P. and J.B. Singh. 2003. Relative efficacy of some insecticides against brinjal fruit and shoot borer, *Leucinodes orbonalis* Guen., and their impact on fruit yield. *J. Asia-Pacific Entomol.* 6(1):83-90.
4. Alam, S.N., et al. 2003. *Development of an Integrated Pest Management Strategy for Eggplant Fruit and Shoot Borer in South Asia*. AVRDC.
5. Dhas, S. and M. Srivastava. 2010. An assessment of carbaryl residues on brinjal crop in an agricultural field in Bikaner, Rajasthan (India). *Asian Journal of Agricultural Sciences*. 2(1):15-17.
6. Alam, S.N., et al. 2006. *Implementation and Promotion of an IPM Strategy for Control of Eggplant Fruit and Shoot Borer in South Asia*. AVRDC.



Brinjal



ESFB larvae



ESFB damage



Spraying for ESFB