

Study of Growth pattern in *Bt* cotton cultivar of East- Nimar Region against some pesticides

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ABSTRACT

Cotton is an important commercial crop of India. *Bt* cotton is a GM crop having insecticidal properties and provide solution for bollworms. Some pesticides are still advised for better crop protection. This study is made to see the effect of pesticides on *Bt* cotton variety Ankur 09 with some growth parameters. It is seen that doses of pesticides affect the growth of the plant, which ultimately affect the productivity.

Key words : *Bt* cotton, pesticides, Ankur 09

Cotton the world's most important non food agricultural commodity was one of the first vegetable fibre used for textile purposes with millions of people engaged in its cultivation, processing and marketing. Cotton plays an important role in national economy. After china, India is the largest producer and consumer of cotton. Where India shows 4.9 million tonnes production per year and contributes 30% of foreign exchange. It also generates high employment at various stages starting from cultivation to ginning, spinning and garment making.

After facing many pest problems, development of transgenic *Bt* cotton is the one best solution. Study on economics and adoption of *Bt* cotton in India shows that this biotech

crop has gained substantial popularity and acceptance in many parts¹.

East and West-Nimar are the main cotton growing districts in M.P. Soil of the area, mean temperature, annual rainfall and sunshine conditions favour the growth of cotton crop⁵. Development of *Bt* cotton provides solution for bollworms. But even today, the crop is not getting adequate benefit and it is so because of knowledge of identification, monitoring of pest and specific use of insecticides, credit problems and social linkage, which ultimately lead to pest resurgence, insecticide resistance, environmental pollution and increased expenditure³.

The present study is made to see the

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effect of some pesticides on *Bt* cotton variety by using some growth parameters. *Bt* cotton is a product of intense scientific research and pesticides also play a critical role. But when they affect growth, ultimately they affect the productivity.

Seeds of one *Bt* cotton var. *Ankur 09* were collected from cotton research centre and experiment was based on randomized block design. Two insecticides Confidor (Imidachloprid) and Hostathion (Triazophos) were taken as recommended by Department of Agriculture for this area.

Three concentrations of each pesticide were taken as recommended, half fold and two folds to recommended dose. 15 DAS, plants were treated with different pesticides with different doses and water sprayed plants were taken as control.

At post flowering stage [90-100 DAS] root and shoot length and leaf area of plants were recorded. Leaf areas were calculated graphically. Root and shoot length were measured in centimeters.

Table - Effect of Pesticides on growth of *Bt* Cotton cultivar *Ankur 09*

S. No.	Pesticide	Parameter	Concentration of Pesticides			
			Control	R	1/2R	2R
1	I_1	Root Length (cm)	18	16	19	16
		Shoot length (cm)	35	33	39	31
		Leaf Area (cm ²)	40.26±2.30	32.24±2.15	32.42±1.26	28.48±1.15
2	I_2	Root Length(cm)	18	18	29	15
		Shoot length(cm)	35	32	42	28
		Leaf Area(cm ²)	40.26±2.30	32.32±1.80	35.18±1.25	31.05±1.20

Where : I_1 - Insecticide Confidor & I_2 - Hostathion

R- Recommended dose, 1/2R- Half fold to recommended dose & 2R- Two folds to recommended dose

The metabolic activities of a living cell can be visualized by its growth. Pesticide phytotoxicity can result only if pesticide is translocated from soil to the plants through the leaves and roots. In lower concentration, the hostathion was found as growth enhancer, but high concentration of the pesticide inhibited the growth due to accumulation of the metabolites

in plants. Decrease in leaf area in higher concentration of quinalphos is was recorded due to inhibition of the photosynthetic apparatus as it acts as photo-oxidant, leading to the destruction of chlorophyll and thereby causing decrease in chlorophyll pigments². In the experiment, increased plant height of the cultivar was seen with half fold to recommended dose, but at higher

doses reduced growth was seen in terms of Root- shoot length and leaf area. Carbamate herbicides are known to repress cell division as a consequence of their interference in nucleic acid metabolism and protein synthesis⁴. Thus it is essential to develop perfect knowledge of identification and monitoring of pests, use of specific pesticide, appropriate doses and other socio-economic problems, only then we can adopt a transgenic crop in our real life.

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