

**Research Article**

## **MULBERRY PLANT IMPROVEMENT THROUGH GIBBERELIC ACID IN SHOOT, ROOT AND LEAF AREA AT DHAR BLOCK**

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### **ABSTRACT**

Mulberry foliage is the main basic food for silkworm. The quantity and quality of silk completely depends on the healthy growth of host plants. Increased quality foliage production for feeding silkworm through improved cultural practices and nutrients management plays an important role in silkworm development and cocoon yield. The nutrition of phytophagous insect like silkworm has been clearly linked with that of host plants. The development and growth of plant has been improved by increasing assimilation rate and directing its movements to the foliage through the application of growth regulators in agricultural and horticultural crops. In this direction a study was carried out which shows treatment of 100ppm GA3 a plant growth regulator (PGR) in S146 variety of *Morus alba* L. recorded an increase of 40% shoot length, 70% in root length and 29% in leaf area over control under Dhar Block condition. Study recommends the use of GA3, in sericulture for good growth and development of mulberry plants to increase silk production in country.

*Key Words: Mulberry, Growth Regulator, Gibberellic Acid, Plant Growth Regulator.*

### **INTRODUCTION**

Mulberry foliage is the main basic food plant for silkworm (*Bombyx mori* L) for the growth and development of silkworm larvae and the economic characters of cocoon. These were highly influenced by the nutritional contents of mulberry foliage. The quality and quantity of mulberry leaf production very much depends on various factors such as varieties, agro climate conditions and package of practices. But (Alan and Tolbert, 1957) reported that quality and quantity of the leaf can be increased by application of phytohormones and other plant hormones (Alan and Tolbert, 1957). It has been proved that the level of hormones in the plants directly or indirectly control the growth and physiology of insects feeding on them.

Efforts have been made to improve the quality and quantity of mulberry foliage by use of fertilizers, better management coupled with variety development and genetic improvement but scanty efforts has so far been made to improve mulberry plant through the use of plant growth regulators, which are simple, easy to use, required in small quantity (Goodwin and Anthony, 2000). Looking the beneficial effects of plants growth regulators on various crop plants in improving the crop quality the present experiment was taken to study the improvement in S146 mulberry variety of *M. alba* L. under Dhar Block condition.

### **MATERIALS AND METHODS**

The study was conducted in sericulture mini research centre at Dhar Block of Punjab during 2014-2016. The soil of the area was acidic in nature, clayey loam, gravels, high in organic matters, high organic carbon, medium in phosphorous and high in potash (Datta *et al.*, 2002). The soil of the area is deep and fairly permeable.

Stem cutting of S146 mulberry genotype was collected and uniform size cutting were prepared. These cutting were soaked in 25 ppm, 50 ppm, 100 ppm GA3 solution keeping 0 ppm as control for 24 hrs. (Maurya *et al.*, 2006). Land was prepared for the laying out of experiment by deep digging. Farm yard manure at the rate of 20 tons per acre was applied and thoroughly mixed with soil. The plot sizes of 5m\*5m were prepared for experiment. The treated cuttings of S146 mulberry genotype were planted in randomized block design, replicating four times at the distance of 90\*90 cm. Containing 25 cuttings in each plot in such a manner so that at least one bud should be above the grounds (Maurya *et al.*, 2006).

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Watering was done at regular intervals. Cultural practices were also as per standard package of practices during experimentation in all treatments when required. After mulberry sapling attained a height of about 30 to 40 cm, foliar sprays of another dose of GA<sub>3</sub> was applied after 2 months with help of auto mixer. The experiment was maintained for the period of 6 months after planting. Therefore 10 plants from each replicates were uprooted carefully by digging the complete root to bottom of each replicates was plucked randomly. The leaves collected were taken immediately to the laboratory and leaf area, 100 leaves from top to bottom of each replicates were plucked randomly. The leaves collected were taken immediately to lab. And leaf area was measured by leaf area meter carefully (Shukla *et al.*, 2006). An average root, shoot length and leaf area were recorded for each replication and repeated 2 times. Data was analyzed and presented in tabulated form Shown in given table.

### RESULTS AND DISCUSSION

The data revealed that Roots, Shoots length and leaf area under study have been improved than control and were statistically significantly very much clear from table (given below) by Different GA<sub>3</sub> treatment (Singh, *et al.*, 2007). An increase of 40.47% was recorded in shoot length by 100 ppm GA<sub>3</sub> over control followed by 50 ppm and then 25ppm. Root length was increased 70.40% (100 ppm GA<sub>3</sub>) followed by 50 ppm and 25 ppm. Leaf area improvement was recorded 29.75% same sequence as found by Root and shoot Length cases. The sequence of enhancement in Result of doses was same in three cases *i.e.*, 25, 50, 100 ppm of GA<sub>3</sub> (Atefeh *et al.*, 2014).

**Table 1: Affect of GA<sub>3</sub> on Roots, Shoots length and leaf area**

GA <sub>3</sub> treatment	Enhance in Shoot Length	Enhance in Shoot Length in%	Enhance in Root Length	Enhance in Root Length in %	Enhance In Leaf Area	Enhance in Leaf Area in %	Significant results
0ppm	105	No change	24.50	No change	242.35	No change	No change
25 ppm	114	9.04	28.75	17.34	269	11.6	Significant
50 ppm	119	13.80	34	38.77	291	20.30	Significant
100 ppm	147	40.47	41	70.40	314	29.75	Significant
Mean	121	21.10	32.25	42.17	279.45	20.40	

The significant improvement of Shoot, Root and Leaf area by GA<sub>3</sub>treatments at different concentration *i.e.* 25, 50, 100 ppm may be due to the photosynthesis active radiation penetration in crop canopy. Moreover application of growth regulators stimulates the water uptake. The protein and free amino acid contents and increase the sugar and starch contents, which ultimately contributed to yield and other mulberry growth parameter (Shashi Kanta, 2018). The present study indicates that all three concentrations of GA<sub>3</sub> *i.e.*, 25, 50, 100 ppm significantly improved the mulberry growth parameters morphological character in Dhar Block conditions.

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