

Research Article

IMPROVEMENT OF MULBERRY (*MORUS ALBA*) FOLIAGE QUALITY USING GA3 IN HILLY CONDITION OF DHAR BLOCK

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ABSTRACT

Mulberry foliage is main food of silkworm which converts leaf protein into magical silk. The quality and quality of silk completely depends on the health and vigor of mulberry plant. Increased quality foliage production for feeding silkworm by improved cultural practices and nutrients management plays an important role in silk production. The production of quality foliage can be increased by increasing assimilation rate of plant and directing its movements to the foliage through the application of growth regulators. In the direction, foliar spray of 100 ppm GA₃, a plant growth regulator in variety S146 *M. alba* L. recorded an increase of 29.75 % in leaf area, 5.86% increase in foliage moisture content and 11.9% increase in foliage moisture retention capacity over control in Dhār Block of Punjab. The study recommends the use of GA₃ in sericulture for improvement of foliage production in our country.

Keywords: Growth regulators, GA₃, Mulberry Foliage, improvement, regulator and sericulture

INTRODUCTION

The leaves of mulberry (*Morus* sp.), traditionally used for silkworm rearing, is known for its high protein content with good amino acid profile, high digestibility, high mineral content, low fibre content and very good palatability. *Morus alba*, commonly known as white mulberry, is a tree which is native of India, China, and Japan (Atefeh Sheikhlari *et al.*, 2014). In the past, mulberry was mainly cultivated for the silkworm industry.

Mulberry is the main food of silkworm (*Bombyx mori* L). Its quality and quantity very much depends on the good health and vigorous of plants growth. The growth and development of silkworm larvae *Bombyx mori* L and the economics characters of cocoon were greatly influenced by the nutritional content of mulberry foliage (Boase *et al.*, 1995). To get a good cocoon were greatly influenced by the nutritional content of mulberry foliage. To get a good cocoon crops, the quality and quantity of mulberry foliage has to be improved (Boschini, 2002). In the past, mulberry was mainly cultivated for the silkworm industry, today; efforts have been made to improve the quality and quantity of mulberry foliage by mulberry foliage 1. The use of fertilizers

2. Better management coupled with variety development and

3. Genetic improvement

But no efforts has so far been made to improve the mulberry foliage through application of growth regulators (Boschini, 2002), which are simple, easy to use required in small quantity and economics with no or little harm. Looking into the beneficial effects of plant growth regulators on various crop plants in improving the crop quality. To make qualitative and quantitative improvement of mulberry foliage through GA₃, application in Dhār Block was our present study (Datta, *et al.*, 2002).

MATERIALS AND METHODS

The experiment was conducted in Dhār Block for one year. One year old plantation of S146 genotype was selected. Experiments were simultaneously conducted with *Morus alba* foliage with of growth regulator GA₃ at three places and treatment by different doses i.e., 25ppm, 50ppm and 100ppm on 25 plants of 90*90cms plot in Dhar Block Area. The experiment was laid in randomization block design (Karaishshi *et al.*, 1957). Three data foliage area, moisture content and retention was noted of different doses taken for experimental results.

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RESULTS AND DISCUSSION

By Applying different doses of GA3 25ppm, 50 ppm and 100 ppm on Mulberry plant. The data revealed that foliage area, moisture content and retention capacity have improved significantly (Martin, *et al.*, 2002). The result seen from following data was

The maximum increase in Foliage area is recorded maximum in 100 ppm followed by 50 ppm and least in 25 ppm. Trend for Leaf moisture was again same the maximum was recorded 5.80 % in 100ppm as 5.3% in 50ppm and 3.6% in 25ppm respectively (Martin, *et al.*, 2002). The maximum improvement in moisture retention capability is recorded in 100% ppm followed by 50ppm and 25ppm with GA3 treatments.

Table 1: Influence of GA3 on s146 Mulberry foliage Quality

GA3 treatment	Leaf Area	Increase/decrease	Leaf Moisture	Increase/decrease	Moisture Retention	Increase/decrease	Level of Significance
0ppm	242.35	No change	77.18	No change	63.49	- No change	No change
25ppm	269.42	11.16	80.02	3.67	68.22	9.27	significant
50ppm	291	20.30	81.33	5.37	69.38	9.27	significant
100ppm	311	29.75	81.66	5.80	71.06	11.92	significant
Mean	279	20.40	80.05	4.94	68.04	8.35	-

Overall result is significant. It is much clear from above table. The result was very significant with leaf area, Leaf Moisture and Moisture Retention of mulberry by different doses of GA3 at different concentrations (Maurya *et al.*, 2006). It may be due to increase the photosynthesis activity, radiation penetration in crop canopy. Growth regulator stimulus the water uptake increases the protein and free amino acid contents and increases the sugar and starch contents and its retention capability in mulberry were also due to the stimulated water uptake (Saddu *et al.*, 2004). So far as the moisture retention capacity of foliage is concerned, a significant increase in GA3 Concentration has increased. Moisture content of foliage may have direct correlation with leaf cell. It is a well known fact that with greater foliage area. Evaporation also increased which ultimately affects more water consumption. Moisture retention capability also increased due to leaf and cuticle thickness in plants thereby minimizing the surface evaporation of foliage, (Santosh Kumari *et al.*, 1990) also reported that water content of foliage increased due to GA3 treatment and different climate conditions that have correlation with leaf areas, as observed in present study. The above findings are in accordance with Plant growth regulator GA3 only improve the growth, if its concentration increases (Singh and Makkar, 2000). On the basis of above finding, it is concluded that GA3 has improving effects on mulberry foliage over the control significantly under Dhār Block. These are the desirable characters for silkworm feeding, (Patra *et al.*, 2000) it is suggested that GA3 may be used in sericulture for improving of mulberry foliage quality as well as quantity to get good cocoon production.

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