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Control of Red Leaf Disease of Cotton with Balance Soil Environment in Sindh, Pakistan

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Abstract: The Red leaf disease (Garh Pani) in cotton is main problem of Sindh, Pakistan. The soil environment conditions are main factor of development of red leaf disease in Cotton. Therefore , in present work author emphasized on soil environment condition management .It is observed during two year field experiments that proper soil environment condition management during drought and high moisture periods is best remedy for red leaf disease of cotton in Sindh. The Altai liquid organic fertilizer with different dozes is best gradient for balance of soil environment conditions management to resists red leaf disease.

Keyword: Red leaf, Soil environment, Cotton, Liquid Organic Fertilizer

INTRODUCTION

The red leaf disease (Grah pani) damaged thousands of acres of cotton in Sanghar, Mirpur Khas, Nausher-O-Feroz, Nawabshah and other districts of Sindh during 2009 and 2010 crops **(Fig.1)**. Red leaf

Fig.1. Affected cotton at Mirpur Khas 2009.

was first recognized as a problem 1998-199 in Pakistan. Ayub Institute Research Institute (AARI), Nuclear Institute for Agriculture and Biology (NIAB), National Institute for Biotechnology and Genetic Engineering (NIBGE) immediately started work to introduce red leaf resistance seeds and produced seed varieties (Parveen, *et al.,* 2010)The introduction of the above mentioned seeds had fewer successes to protect cotton from disaster.

According to Alios, A. Bell *et. al.,* red leaf is result high soil temperature of soil, high pH of soil, drought followed by rain/excess of irrigation water, high rate of nitrogen fertilizer and deficiencies of phosphorous, sulfur or potassium and concentration of unique strain of Agro bacterium Tumejacies. Soil born infections diseases leads towards development of the entity and produced seed–rot symptoms in pre-emergence conditions which drying plant growth at all stages up to adult stage. The cotton root rot is also serious and destructive disease that affects cotton yield and lint quality (Muhd. *et al.,* 2010) salinity/sodicity also show adverse influence on the plant growth (Muhd. *et al.,* 2010) While physical parameters of environment role in cotton crop is discussed by (Muhd. *et al.,* 2001). All above mentioned suggest soil environment conditions are main factor in development of said plant disease. Therefore, an experiment was deigned maintain balance soil environment conditions smooth plant growth and discouraging red leaf disease.

MATERIAL AND METHOD

The three plots one acre each was prepared at different sites with different soil properties. The soil of each experiment site was as below:

1. Sandy clay soil at Mirpur Khas,
2. Calcareous sandy soil at Khathar

These plots were dived in control and experiment plot and variety of cotton selection for experiment was priority of growers.

The material Altai Organic Liquid Fertilizer was provided by Index Group, Moscow, Russian Federation. Each experimental plot was treated with

Altai Liquid Organic Fertilizer with doze of 1 liter/acre through flooding watering during preparation of soil for seedling of cotton. The three foliar treatments with 250ml/acre during vegetation of cotton plant. All foliar treatments were applied in early morning or evening time.

RESULTS AND DISCUSSIONS

The Altai Organic Liquid Fertilizer gives physical, chemical and biological benefits to soil and create balance environment conditions in drought and high humidity for plant growth and also increasing photosynthesis system of plant. It also maintains balance supply of nutrients during drought and excess of moisture during rain and flood irrigation.

The moisture holding capacity of above mentioned fertilizer during drought season farms jelly at root zone and maintain continuous supply of moisture and nutrients to plants. This phenomenon maintains soil temperature to requirement of cotton plant and discourages development of conditions favoring to adverse source. While microelements parent in Altai Liquid Organic Fertilizers cover deficiencies (Alois, *et al.*, 2009) may favor Red Leaf disease in cotton crop.

In Mirpur Khas, Matili and Khathar control plots were attacked by read leaf disease while the bordering experimental plot treated with Alati Organic Liquid Fertilizer remain unaffected **(Fig.2)** which proves the soil environment control lateral migration of red leaf disease. Usually red leaf attack destroys all crops of soils. While in Khathar cotton crop experiment plot was flooded by rain water coming from mountains. But plots remained unaffected by excess of water and red leaf disease. It is due to factor of holding nutrients from leaching fat root zone and release as per demand of plant and provides aeration to roots of plants.

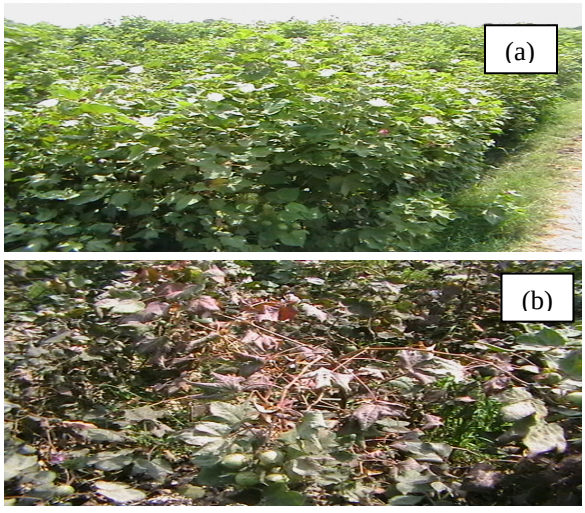

Fig. 2 (a) normal growths on experiment plot while (b) control plot attacked by red leaf.

The foliar treatments increase photosynthesis system of plant which results increase immunity of plant. The experiments were carried out in 2009 and 2010 cotton seasons at Mirpur Khas and Matili experimental plots also. While Kather location was new addition to experiment in 2010. It is also observed that for smooth and equal distribution of fertilizer with flooding treatment level of plots with laser leveler is very necessary.

CONCLUSION

The balance environment of soil and supply of nutrients to plant during drought and high moisture and hot weather temperature are very important for cotton plants. The Altai Organic Liquid Fertilizer develops above mentioned conditions in soil and at root zone which discourage conditions for soil infections and other factors which have adversely impact on cotton growth especially red leaf disease.

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