498 Kumar, S

Lightning damage on rubber plants in West Bengal

Sandeep Kumar* , Gitali Das and Gopal Chandra Mondal**

*Regional Experiment Station, Nagrakata-735 225, Jalpaiguri, West Bengal

**Regional Experiment Station, Guwahati-781 006, Assam

Rubber plantations in non-traditional region experience an assortment of environmental stresses. These include abiotic (viz. extreme variability of high and low temperature, drought, alkalinity, water logging etc.) and biotic (viz. Pests and diseases, weeds, wild and domestic animals etc.) stresses and occur at various stages of growth affecting the crop adversely. Lightning is a spectacular phenomenon creating threat to all types of plantations, including rubber (*Hevea brasiliensis*) of all age groups. The damage may be in isolated or in scattered form. Usually, lightning occur with thunderstorms and most likely hit tall trees, with an upward stroke of current, in excess of 10,000A, passing through the trees, causing excessive internal heating. This results in the splitting up of vascular tissues and cracking of trunk (Vinod, 2012). Lightning may cause 0.51 to 5.8% annual destruction in different plant communities (Steenbergh, 1972) and proved to be one of the important detrimental factors in rubber plantations (Sharpies, 1933). This article is about the obsevations made at Regional experiment Station (RES), Nagarakatta (Jalpaiguri District, West Bengal) on the effect of lightning on rubber trees and the threat it poses to rubber cultivation in non traditional area. There were three severe lightning discharges in the area of Nagrakata RES which lead to damage of rubber plantations within

*Corresponding author - email:sandeepchokar@gmail.com

45km distance. First discharge was in 2012 and second strokes were about half a kilometre from each other in August, 2013. These three discharges were severe and peculiar lightning strokes were observed creating much damage to rubber plantations.

Wilting of rubber trees was observed within two days of lightning strike and followed by severe bark cracking followed by attack of insect borer. After the stroke, a small droplet of latex with scorching was observed on mature leaves and wilting of leaves started along with some cracks in the bark of the trunk. After a few days, the leaves started drying and drooping, bark disrupt and become detached from the wood. About three weeks after the stroke, two plants were completely dried and three plants subsequently dried in next two weeks. However, five plants showed damage more than fifty per cent and three plants were partially affected. In partially affected trees, die back at the top and complete drying of branches were observed.

Careful examination of root systems of affected trees showed that the root was healthy and no unusual effect was observed. However, latex exudation was found on secondary roots. To protect the plant from subsequent fungal infection, damaged bark was removed and rubber coat was applied after washing with propiconazole (5ml/L water) solution. However, recovery was not observed in plants where damage was more than fifty per cent. Two plants were severely affected after the stroke, followed by wilting, scorching and insect borer attack which leads to dying of plants in a patch at regional experiment station (RES), Nagrakata, in 2013.

In another incidence, about 45 km from the RES, a rubber plantation at Sarugaon Tea Estate, Ethalbari, Jalpaiguri, West Bengal was severely affected.

Rubber plantations in non-traditional region experience an assortment of environmental stresses. These include abiotic (viz. extreme variability of high and low temperature, drought, alkalinity, water logging etc.) and biotic (viz. Pests and diseases, weeds, wild and domestic animals etc.) stresses and occur at various stages of growth, affecting the crop adversely

Five plants were instantly dried, four plants were subsequently dried and two plants were partially affected and dried later in this single lightning stroke. Direct lightning on rubber trees is fatal and the trees eventhough survived become unsuitable for tapping. In the present case, wilting, scorching and latex droplets were observed on leaves. Splitting of vascular tissues, bark cracked and detached from wood and severe insect borer attack were observed in mature rubber plants affected more than fifty per cent and completely dried subsequently. However, dark streaks of vascular burning were observed in immature plants which were completely dried later on.

References

Steenbergh, W. F. (1972) Lightning caused destruction in a desert plant community. *The Southwestern Naturalist.* 16 (3&4): 419-429.

Sharpies, A. (1933) Lightning storms and their significance in relation to disease of (1)*Coccus nucifera* and (2) *Hevea brasiliensis*. *Annals of Applied Biology.* 20: 1-22.

Vinod, K. K. (2012) Stress in plantation crops: Adaptation and management In: Crop Stress and its Management: Perspectives and Strategies (Eds: Venkateswarlu, B., Shanker, A.K., Shanker, C., Maheswari, M.) *Springer Science* and *Business Media B.V.* pp 45- 137, isbn:978-94-007-2219-4