SHISHAM & KIKAR

Mortality in India

Edited by

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SHISHAM AND KIKAR MORTALITY IN INDIA

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Bhatinda. I have gone through the publication and appreciate the efforts of the editors in making it a fruitful by involving all the representatives of the affected states, including Uttar Pradesh, Uttranchal, Bihar, Rajasthan, Haryana, Himachal Pradesh and Punjab. The involvement of Forest Officers from different states is also a welcome step as it strengthens field observations. Contributions made by the scientists, will be helpful in the formulation of specific research projects under a coordinated effort to delineate the problem with specificity and offer suitable control measures to save these valuable tree species for posterity. I hope this document will form the base for planning future strategies on this emerging problem and will help all the concerned directly or indirectly. Editors have made appreciable efforts in bringing out this publication in the present form. I congratulate them to translate their efforts in the form of this publication, which will be helpful to the scientists, planners, managers, students and farmers.

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(AS Sandhu)
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PREFACE

Two species, shisham and kikar are virtually indispensable owing to their importance for various purposes and their acceptance for plantation on a wider scale, both under social forestry/agroforestry and national afforestation programmes. Where, shisham (*Dalbergia sissoo)* is distributed primarily in the foothills of Himalayas, kikar (*Acacia nilotica*) has wider distribution covering large tracts of sub–tropical and tropical parts of the country. Both of these species are part of the natural landscape of the country. Both the speices are considered as quite hardy in nature especially to withstand droughts and therefore classified among xerophytes. They are found to grow on a variety of soils under different fertility regimes, surviving on inhospitable sites also. However, even in spite of these attributes, a serious die back problem has been noted in these species, covering almost all the age groups and under almost all the situations where they are found growing. This includes forest areas, farmer fields, roadside/canal side plantations, dry areas, wet soils, etc. This has virtually challenged the very survival of these species, as at some locations the mortality recorded is as high as 80 per cent.

The Indian Council of Agriculture Research after analyzing the alarming situation in respect of these species decided to organize a regional symposium, and a final decision was taken to hold the same at Krishi Vigyan Kendra, Bhatinda of Punjab Agricultural University, Ludhiana. The participation from different institutes including SAUs, ICAR/ICFRE institutes, State Forest Departments was registered, which made significant impact on the proceedings of this symposium.

The deliberations focused on the causes and control measures of the malady. A number of causal factors were reported including a host of fungal and pest infections. *Ganoderma, Rhizoctonia, Fomes, Polyporus, Phyllactinia, Fusarium, Uredo, Hypoxilon, Lopharia, Duportela, Xylaria, Thalifor, Daldinia, Cercospora, Alterneria,* etc. were the major fungal groups reported. Similarly, among insect–

etc. He has more than 65 research papers published in national and international journals. Dr Khajuria remained academic Council member of UHF Solan and UGC Nominee in board of studies of FRI Dehradun. He has been decorated with best teacher award by PAU Ludhiana.

Dr Rajni Chauhan, Assistant Professor of Forestry (Ph.D.) is mainly working on forest ecological aspects and also emphasizing on mulberry and tahli improvement work from last nine years. She has 22 research paper published in national & international journals. She has worked as Principal Investigator of the adhoc project on reproductive biology of *Dalbergia* funded by ICFRE Dehradun. She is also engaged in teaching and extension activities of the department. Dr Chauhan has presented her research papers in national and international conferences. Three M.Sc. Forestry students has already completed their degree under her guidance.

Editors

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PREAMBLE
Shisham and Kikar Mortality

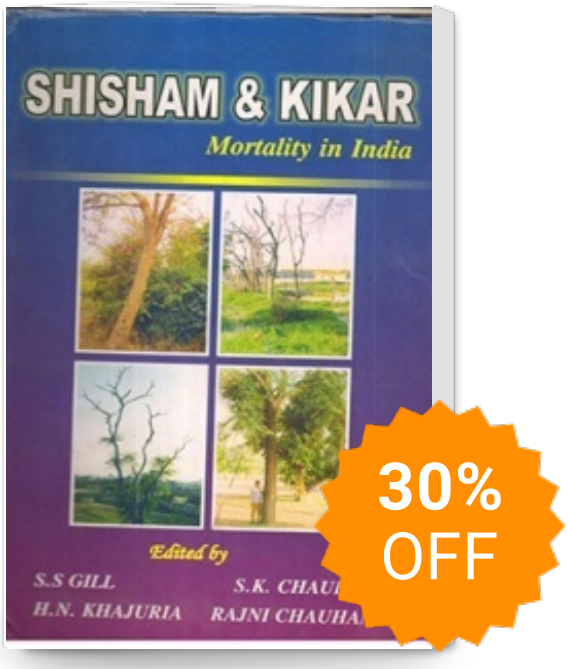
Dalbergia sissoo (shisham) and *Acacia nilotica* (babool/kikar) are among the primary group of multipurpose trees, well accepted and extensively planted under afforestation and a variety of agroforestry systems. With their excellent timber values, one of the highly significant attributes of these tree species is their exceptional capacity to tolerate drought conditions. *Acacia nilotica*, indeed is a xerophytic tree, which is evident from the leaf structures and other modifications. *Dalbergia sissoo* on the other hand, although a riverine species in its habitat, the tree has registered significant drought resistance.

In recent past, the trees of both of these species have been registering severe decline. The dying trees exhibit various symptoms including reduction in leaf size, change in foliage color and then a sort of die-back of the twigs from top downwards. The trees ultimately die within 3-4 years depending upon the age and site. This malady has been observed to have initiated about a decade back in shisham. However, in babool/kikar, it is a few years old only, but the extent of damage has been of alarming nature.

The mortality in shisham and kikar has been registered in almost all the Northern States of the country In Punjab, the mortality level has been registered as very high in the Western districts of the State, which are comparatively arid in nature On an average, 50 per cent of the trees were found dead in Bathinda and Faridkot. In Sangrur and Patiala, at certain locations the mortality was 100 per cent in kikar and 80 per cent in shisham.

Various reports based on limited research inputs have suggested an array of reasons/causes of the foresaid mortality in these species. Scores of insect/pests; fungi including primarily the *Ganoderma* spp. have been found associated with this malady. A very important school of thought has been the implication of weather changes in the habitat of these species. Continued spells of long duration fog, change in cropping patterns, widening of gap

Shisham and Kikar Mortality



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