

## SEEDING PERIODICITY IN BLUE PINE

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Himalayan blue pine (*Pinus wallichiana* A.B. Jacks. Syn. *P. griffithii*) is one of the important indigenous pines of Pakistan with a very large range of natural distribution. Its altitudinal range varies from 1500 to 3040 metres and longitudinal and latitudinal distribution extends over 69° 33' to 75° 35' east and 31° 22' to 36° 10' north respectively in Pakistan and Azad Kashmir. The over all range of this species is 25° 30' to 36° 10' north latitude and 69° to 98° east longitude in the countries of Afghanistan, India, Pakistan, Nepal, Bhutan and China (Critchfield and Little, 1963). The range of natural distribution of blue pine is continuous over a greater part of the tract but isolated patches of this species are also found in extreme west and east of this range. The distribution of blue pine in Pakistan and Azad Kashmir is shown in Figure 1.

Collection of seed from authentic seed sources of blue pine throughout its natural range in Pakistan and Azad Kashmir was started in 1972 with the financial assistance of PL-480 Project of U.S. Department of Agriculture, for establishment of provenance studies of this species (Siddiqui, 1978). At the commencement of the PL-480 project, information was lacking on the exact location, accessibility, flowering and fruiting time of blue pine stands in different parts of the country. Further, due to large extent of distribution, rugged terrain of blue pine forests and limited staff availability, it was not always possible to visit all localities in one year and collect cones at the time of their ripening. Attempts were therefore made to visit as many sites as possible for seed collection each year. A list of seed collecting localities in different forest divisions having blue pine forests in Pakistan and Azad Kashmir is given in Table 1. The table shows that 41 seed collection areas were visited a number of times during the past 7 years at the time of seed ripening.

Blue pine cones ripen from early September to end of October in most of the localities. The mature cones are yellowish green in colour and the time of their ripening varies with locality of collection and mostly depends upon altitude and aspect. Seed maturity in this species is reached a week or more before cone scales open to release seed. No systematic surveys were carried out in the past to determine seeding periodicity in blue pine. However, according to Troup (1921) "good seed years are more frequent (in blue pine) than is the case with any other important Himalayan conifer; and a year seldom occurs in which at least a fair proportion of trees in a blue pine forest do not bear seed, while in good years seed is produced in large quantities".

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TABLE 1

*Description of seed collection localities of blue pine*

S.No.	Forest Division	Localities	Altitude m	Year of collection
1.	Zhob	Kaisaghar	2606-2688	1972, 1973, 1976
2.	Kohat	Mermaidangi, Bagh-i-Laila, Speenashaga	2164-2530	1972, 1973, 1974, 1975, 1978
3.	Chitral	Bamburet, Madaglas, Kalas	2134-2530	1972, 1974, 1975, 1978
4.	Dir	Kalkot, Kumrat	2225-2438	1972, 1973, 1974, 1975, 1978
5.	Swat	Ushu, Utror, Kalam, Miandam, Shangla	1951-2591	1972, 1973, 1974, 1975, 1978
6.	Hazara (Galis, Kaghan and Siran)	Shogran, Dewan Bela, Sharan, Naran, Batakundi, Dungagali, Kalabagh, Thandiani, Kund, Kuzagali, Malakandi	1524-2895	1972, 1974, 1973, 1975, 1976, 1977, 1978
7.	Murree	Bhurban, Garhial, Patriata, Jekagali	1524-2134	1972, 1973, 1975, 1976, 1977, 1978
8.	Azad Kashmir (Keran, Jhelum Valley and Punch)	Athmuqam, Tararkhal, Dungian, Dawaryan, Sharda, Kathanpeeran, Keran, Khaigala	1554-2591	1973, 1974, 1975, 1977, 1978
9.	Gilgit	Naltar, Basho, Rama	2743-2804	1973, 1974, 1975

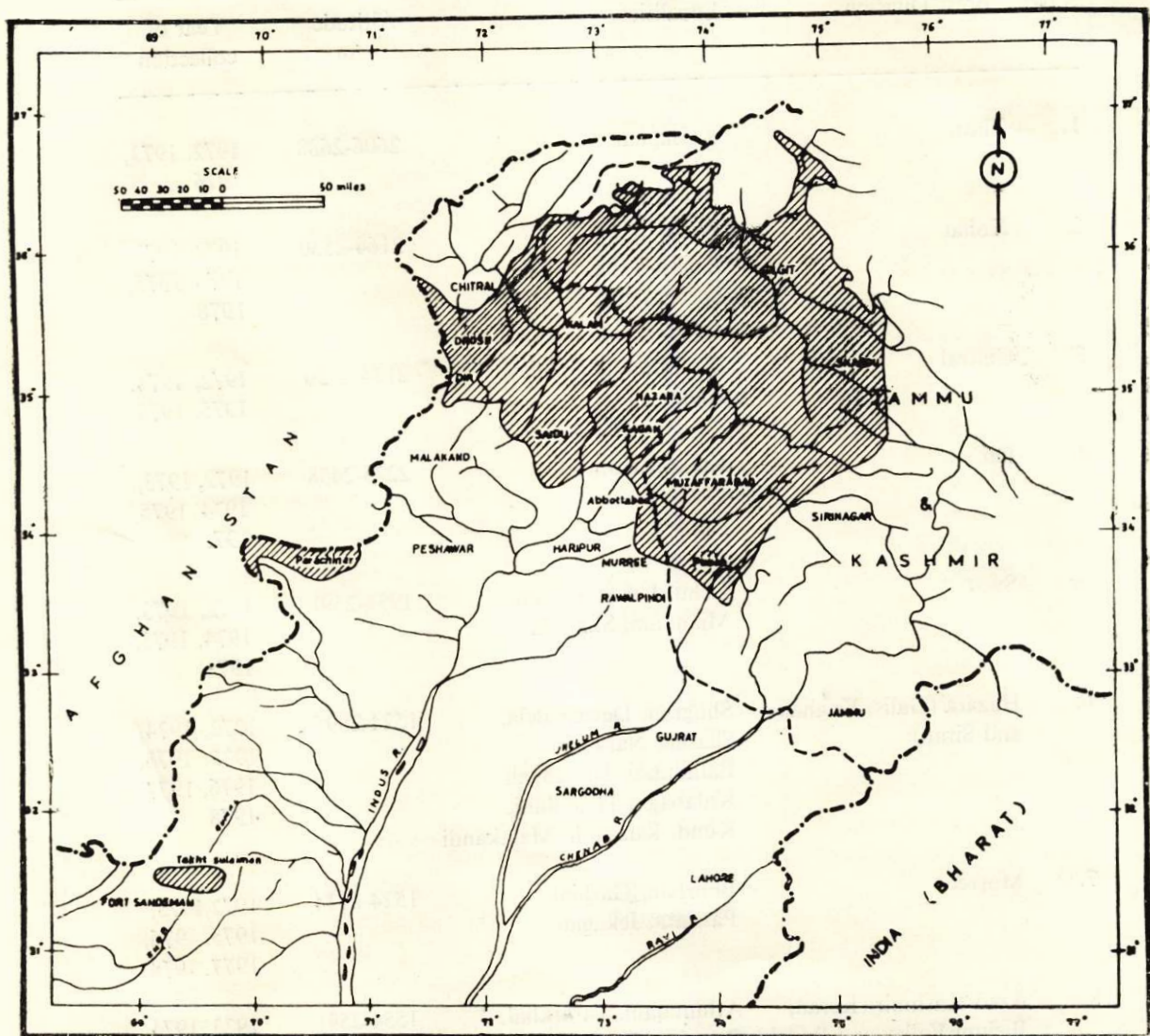


Fig. 1. Range of *Pinus wallichiana* A. B. Jackson in Pakistan & Azad Kashmir

Experience of seed collection within the natural range of this species in Pakistan and Azad Kashmir during the last 7 years has shown that good seed years may be less frequent than commonly anticipated. For instance, 1972 and 1973 were poor seed years throughout the natural range of this species due to non-availability of cones on most of the trees in a number of localities. However, 1974, 1975 and 1976 were good seed years. Almost all the trees had few or many cones during this period and sufficient seed could be collected. Fair amount of seeding was observed during 1977 and sufficient seed was collected from 10-15 selected trees in each locality which was visited during the year. It was followed by poor seeding in 1978 over major part of natural range of blue pine in Azad Kashmir, Murree and Hazara. Seeding was fair in Dir, Swat and Chitral at this time.

Field observations of seeding of blue pine reported in this paper indicate that seed production in blue pines follows a cycle of two years of poor seed production followed by 3-4 years of fair to good seed production. The time taken from the first appearance of female flowers to the ripening of cones is approximately 16-18 months. From April to about October, there are two types of cones on trees, one terminal and small and the other lateral and large, followed by one or two stages of mature open cones. The trend of seed production in this species can be reasonably predicted for next two years at this time. During field trips in 1978 it was observed that the prospects of seed for 1979 were not good over major part of its range. Under these circumstances it is necessary to plan seed collection in blue pine judiciously so that enough seed is collected during the year when seeding is good to meet the current need as well as to cater to the requirements of seed during lean seed years.

#### Literature Cited

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