



# Newsletter

## Pakistan Forest Institute, Peshawar



**Chief Patron: Syed Said Badshah Bukhari**  
Director General

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Extension Specialist

### REVITALIZATION OF PFI

A meeting regarding the revitalization of PFI was held under the chairmanship of Mr. Hameedullah Jan Afridi, Federal Minister for Environment in the Ministry of Environment, and attended among others, by the Secretary, MoE, and the Director General, PFI. The meeting was intended to return to the PFI its past glory and higher niche at national and international level.

Being concerned and willing to ensure that the PFI is brought out of its present impasse, both the Honourable Minister and the Secretary, MoE made on-spot decisions on the recommendations of the DG, PFI. Some such decisions include, among others, filling of vacant posts (through promotions, initial recruitment, deputation; contract appointments; and visiting faculty), review of Service Rules, capacity-building of staff, revision of syllabi; restructuring/rationalization of course fees, formulation of Research Plan, revival of Research Review Committee and regular holding of annual passing-out/convocation ceremony. It was also approved in principle that the PFI be upgraded to the status of National Forest University.

### PFI PLANTS 1000 SAPLINGS ON THE NATIONAL TREE PLANTING DAY

The President of Pakistan has declared August 18, 2009 as the National Tree Planting Day.

In this regard, Pakistan Forest Institute under the guidance and leadership of Syed Said Badshah Bukhari, Director General, Pakistan Forest Institute planted 1000 seedlings of different tree species in the premises of Pakistan Forest Institute.

This was stated in a press release issued here on Tuesday which added that the officers, staff and students of Pakistan Forest Institute took great interest and participated actively in the tree planting campaign and displayed banners at different places through out Peshawar University Campus to create awareness among the different segments of the society.

Besides planting within the campus, the event was also celebrated in the field stations of PFI at Rakh Daggar Kotli

(Bhakkar) and Shinkhari where 6500 seedlings were planted.



### INSECT POLLINATORS MANAGEMENT AND CONSERVATION A GLOBAL CONCERN

**Naveed Ahmed A. Forest Entomologist**

Pollinators are essential to our environment. The ecological service they provide is necessary for the reproduction of nearly 70 percent of the world's flowering plants, including more than two-thirds of the world's crop species. Beyond agriculture, pollinators are keystone species in most terrestrial ecosystems. Constanza *et al.* (1997) estimate that annual services due to pollinators is worth \$112 billion. Another independent estimate rates the value of pollination services for global agriculture at \$200 billion. Honeybees are believed to pollinate \$10 billion worth of crops in the USA annually.

Bees—both European honey bees and native bees—are the most important pollinators of insect-pollinated crops in the world. Bees are superior and efficient pollinators because they transport pollen and typically visit flowers from a single plant species during each foraging trip,

which ensures that the correct pollen is transferred from plant to plant. Although bees are the most important of pollinators, but flies, wasps, beetles, butterflies and moths all have a role to play. Only a dozen bee species are managed for pollination worldwide, while thousands of the world's 25,000 known bee species and hundreds of other pollinator species may contribute to crop pollination as unmanaged populations.



In several regions of the world, alarms have sounded over declining populations of pollinators. Major drivers of decline in pollinators in different instances are habitat loss and fragmentation, improper land management practices, agricultural and industrial chemicals, parasites and diseases, and the introduction of alien species, making pollinator management and conservation a global concern. In Europe and North America, the number of honeybee colonies has plummeted and most wild bee colonies have been lost. So, there is dire need to make systematic efforts for the conservation of these small heroes.

### JATROPHA CURCAS—A POTENTIAL PLANT FOR BIO-DIESEL PRODUCTION

**Muhammad Tahir Laeeq, SRO**

Like many other countries in the world, Pakistan is a wood deficient country having forests on area of about 4.72 million hectares which constitutes 5.36% of its total land area (Forestry Statistics of Pakistan, 2004). This forest area is

insufficient to meet the wood requirements of the country. More than 75% area of the country is arid and semi-arid which is a limiting factor in plants population and their growth. Moreover, this meager plant resource is continuously subject to heavy pressure of human as well as livestock population. Besides climatic factors in these areas, the human activities restrict the re-vegetation process, resulting in rapid deforestation.

The high rate of population growth in the country has also increased the energy demand manifold; particularly the use of liquid fuel has increased tremendously leading to a huge import bill, which ultimately affects the whole economy of the country.

The hiking prices of petroleum has forced the scientists to search for the alternate energy resources. In this quest, *Jatropha curcas* was identified as a good sources of fuel (Bio-diesel). Originating in the Caribbean, *Jatropha curcas* is drought resistant small tree or shrub which can grow on marginal/poor soils, even on gravelly, sandy and saline soils. Normally it grows between three and five meters in height, but can attain a height up to eight meters under favorable conditions. Once grown the crop has 50 years of life, whereas fruiting may start in two years. It yields 5-12 tonnes oil seeds per hectare which can yield 2-4 tonnes of bio-diesel. The non-edible oil of *Jatropha curcas* has potential of providing a promising and commercially viable alternative to diesel oil. The oil can also be used as illuminant, for making soap, treatment of skin diseases and sores on livestock. The roots are reported to be used as antidote for snake-bites, whereas the oil cake is rich in nitrogen, phosphorus and potassium which can be used as organic manure. *Jatropha* is a valuable multipurpose crop to combat land degradation, desertification and deforestation and particularly to replace petrodiesel.

Keeping in view the multipurpose characteristics and its capacity to cope with threats to environment prevailing in the country, this plant species has good scope for cultivation in arid, semi-arid areas. Some trials on cultivation of *Jatropha* have already been started by PFI at Rakh Dagar Kotli (Thal Desert) under the Forestry Sector Research and Development Project.

#### PROPERTIES OF TEAK WOOD GROWN IN CHANGA MANGA

G. M. Nasir, Logging Officer

Teak (*Tectona grandis*) tree planted in early nineties in Changa Manga on

experimental basis was harvested and the wood material in log form was brought to Pakistan Forest Institute (PFI) in order to test and evaluate its wood properties. The general and anatomical properties of wood were studied in Wood Anatomy Lab. of PFI.

In Teak the sapwood is white to pale yellowish brown and the heartwood is dark golden yellow turning brown with age. The wood is dull, with rough feel and characteristic pleasant odour, but when wet, gives smell like old leather. It is hard and heavy, straight grained, coarse and uneven textured.

The growth rings are distinct, conspicuous with the naked eye, undulating, delimited by lighter zone of larger springwood vessels followed by darker zone of summerwood consisting smaller vessels and dense fibrous tissue.



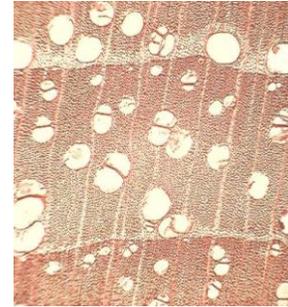
Wood figure

The vessels are of two types. The springwood vessels are very large in diameter (av. 209u), occur solitary or in radial rows of 2-3 (mostly 2) or contiguous in tangential plane and are 4-5/mm<sup>2</sup> in number. The latewood vessels are medium sized to small or very small in diameter (av. 100u), solitary or in radial rows of 2-5 (mostly 2) and are 6-7/mm<sup>2</sup> in number. Tyloses are fairly abundant, often partially; occasionally completely occluded the vessels or the vessels are filled with yellowish or reddish brown gummy deposits.

The wood rays are distinct with the naked eye, medium fine 2-3 cells (42u) in width and 24 plus cells (670u) in height, closely spaced, 4-5/mm in cross section and 10-11/mm<sup>2</sup> in tangential section. These are frequently contiguous to vessels, lighter than the background forming silvery fleck on the radial surface.

The parenchyma is paratracheal, paratracheal zonate, and metatracheal. Paratracheal parenchyma relatively sparse confined to vessels or vessel groups, forming 1-several seriate sheath around the vessels. Paratracheal zonate parenchyma is confined to springwood vessels forming bands mostly 1-6 seriate.

Metatracheal parenchyma is extremely sparse.



Microscopic structure  
of Teak wood

The fibers are non libriform, coarse angled in cross section and not aligned in radial row, thick walled towards the outer margin of the ring, non gelatinous and septate. Average fiber length has been observed as 1.33mm, the diameter 29.83μ and the fibers wall thickness as 4.14μ.

On the basis of average values computed, it has been found that in Teak wood the fibers are long and thick-walled and the wood may be better in strength properties. It may be moderately non-durable because to larger size and somewhat higher frequency of wood rays and need preservative treatment before utilization in order to increase the service life. The wood may be easily treated with chemicals as the vessels are sufficiently large in diameter and higher in frequency. Similarly the wood may give good response during the seasoning process.

On comparison with the reported values for Indian Teak, it has been observed that in locally grown Teak wood the vessels are lower in frequency and smaller in diameter. Maximum values of fiber dimensions are also to some extent greater as compared to Indian Teak. In general, teak wood grown in Pakistan is comparable to Indian teak.

#### SPOTLIGHT ON *ABIES PINDROW* Muhammad Shabbir Mughal Forest Botanist/DBSRD

*Abies pindrow* Royle.

**Synonyms:** *Abies webiana*  
**English name:** Silver Fir  
**Vernacular name:** Partal, Paludar  
**Family:** Pinaceae  
**Status:** Common  
**Elevation range:** 2000 to 3000m

#### Description

A large tree 45 to 60 m height with a diameter of 1.8 to 2.4 m, evergreen, monoecious with conical crown. Needles dark green and shiny on the upper surface but silver colour below. Male cones are in clusters on the lower sides of the last year's shoots while female cones are in

ones or two, erect along the tops of the branches. Female cone is 10 to 16 cm long and 5 to 6 cm in diameter. Seed 1 to 1.2 cm long with a thin papery wing 2 to 2.4 cm long.

### Seed Biology

Flowering time: April - May  
 Seed collection: Dec - Jan next year.  
 Seed/Kg: 10,000-20,000  
 Germination %: 68-90

### Treatment

Seed treated with bordure mixture (Nela thotha) will control seed mycoflora. Sand stratification for one month, Soaking in water for 12 hours.

### Viability/storage

Stored at 3-5°C treated with insecticides / fungicides in airtight sealed containers up to two years.

### Distribution

Native to the Himalayas of the subcontinent including Pakistan, Afghanistan and India. In Pakistan, it occurs on mountain areas of Azad Kashmir, Murree Hills, Hazara, Kaghan, Swat, Dir and Chitral.

### Ecology

Fairly shade-loving tree grows on steep, cool, northern exposures well-drained, deep, rich moist soils formed from various parent materials. It prefers humid cold temperate climate with temperature range of -10 to 30°C. Adapted to precipitation range of 1100 to 2500 mm/year within an elevation of 2000 to 3000m. Susceptible to number of wood rotting fungi.

### Nursery techniques/Propagation

Through seed. Fresh seeds give better results. For its conservation, nursery should be raised in well drained (soils) area in their native region near by water source and road for easy management. It can regenerate naturally but survival percentage is very low due to heavy accumulation of humus.



*Abies pindrow*

### Prospects

Valuable tree of watershed protection but difficult to regenerate. Logging should be limited until regeneration is established.

### Yield

Mean Annual Increment is 4 to 6 m<sup>3</sup>/ha / year.

Rotation age 150 years

### Wood properties

White wood, turning in to light brown with age, straight and even grains and light and soft in strength. Specific gravity ranges from 0.48 to 0.54 and calorific value of 4500 kcal/kg.

### Uses

Planting for watershed protection, timber used for doors / windows, packing cases and plywood, fuel wood and aesthetic value.

### WOOD MOISTURE CONTENT DETERMINATION BY MICROWAVE OVEN

Iqbal Mehmood (WS&PS) and Miss Gul Rukh (ARO)

Generally moisture content (M.C) of a wood sample is determined by cutting its 1.25cm thick piece from a board. The more common techniques used for determination of moisture content are oven-dry, distillation and moisture meter methods. Each technique has its own advantages and certain limitations. Electrical oven is used for drying of hardwoods from 101 to 105°C. However, the use of such oven needs more time and consumption of electricity for the process. Moisture meter is also used to assess moisture content level of wood but this is based on initial weight of the sample, therefore, it gives maximum error when the moisture of the timber exceeds above fiber saturation point (FSP). It is only useful for the timbers which have 12 ± 2% M.C Distillation method is only used for resinous wood species which needs a special type of solvent and other laboratory equipment.

Recently an effort has been made for quick determination of moisture content by microwave oven. The comparison of electrical and microwave ovens regarding drying time and power consumption cost (in Rs.) is as follows:

Type	Oven drying at 0% m-c (min)	Power consumption (Rs)
Electrical oven (2000 w)	240 – 300	80.00
Microwave oven (1500 w)	4 – 5	1.00

This calculation is for a wood sample of size 6cmx2cmx2cm, varying from 60-70% M.C. The three dimensional changes occur in similar way in the two methods. However, the use of both of these methods is not recommended for moisture content determination of resinous woods as they have low melting point of volatile contents.



The use of Microwave oven for determination of moisture content of wood samples

### TRAPPING METHODS USED FOR THE MIGRATORY FALCONS

Mian Muhammad Shafiq Deputy Conservator Wildlife

Falcons belong to family Falconidae. These are migratory birds. Many species of falcons visit Pakistan i.e. Saker Falcon (*Falco charrug*) Peregrine Falcon (*Falco peregrinus*) etc.

The following five methods are used for the live catching/trapping of migratory falcons.

### Khudhu

Majority of the Falcon hunters/trappers use this method for the trapping of live falcons. In this method the feathers of quails/partridges/pigeons are tied with a nylon string. This feather ball is then tied to the leg of Kestrel, long legged buzzard/laggar falcon (decoys). When the hunter see the migratory falcon (Saker/Peregrine) in the air they throw the laggar/long legged buzzard with tied feather ball in the air, the migratory falcons during flight see the prey in the claws of laggar and they try to catch the prey. In this way their legs get entangled with the nylon string and the falcon with the decoy comes down and the hunters trap the falcon.



(Khudhu)

### Paidam

In this method a basket made of mulberry sticks covered with nylon nets is used. A prey i.e. quail/pigeon/partridge is placed inside the basket. When the migratory falcons see the prey they try to catch the prey and this way the string/net get entangled with the legs and the falcon is trapped. These baskets are also placed near the rodents dens.



(Paidam)

### Trangri

In this method a quail is tied with the cotton thread net over the whole body, and the quail is tied with the string. When the migratory falcon tries to catch the quails, their legs get entangled in the net and this way the wild falcons are trapped.



(Trangri)

### Dogazza

In this method three to four sticks of 6 feet in length are used and fitted in V or U shaped which are four to five feet in height and cover the sides by the nylon net with one side open. On this open side a pigeon (prey) is entangled with the help of nylon thread to attract the falcon for hunting. When the migratory falcons see the prey it tries to catch the prey in this way the migratory falcon is trapped in nylon net.



(Dogazza)

### Patti

In this method 10 to 15 feet long net is fitted with the help of two wooden or iron rods this net is approximately 5 to 6 feet in height. This type of nets are fitted in a series pigeons are entangled with the help of nylon thin thread in front of each net, to attract the falcons. The migratory falcon when attack on the prey (pigeons)

and wants to take the prey, it entangled in the net and the trapper catches the falcon.

Majority of hunters/trappers use kestrel spp. (prey) for trapping falcons, few hunters use long legged buzzard, while very less number of hunters use Laggar, partridge, quails etc. The prey species (decoys) for the trapping of falcon were only used for one season.



(Patti)

### ROSEHIPS A POTENTIAL SOURCE OF VITAMIN C

**Tanvir Ahmad Qureshi, Forest Chemist & Sanam Zarif Satti, Biochemist**

Rosehip, is a pomaceous fruit of the rose plant, that typically is red-to-orange, but might be dark purple-to-black in some species. Contrary to the fairly common myth, rosehips are not poisonous. The hips are very high in Vitamin C. Make a tea to relieve cold symptoms, or puree into syrup or jelly mixed with apple sauce.



Bright red hip

In Pakistan, wild rose (*Rosa muschata*) scantily found in Murree and surrounding areas was badly damaged by locals for fodder and fuel purposes. *Rosa muschata* were available in large patches and usually extracted by inhabitants for meeting requirements of local hakims. Chemical evaluation of locally available rosehips was carried out in the Forest Chemistry Branch, Pakistan Forest Institute, Peshawar. Samples of rosehips were procured from different areas of Murree hills. High concentration of vitamin C / Ascorbic acid (1500 to 2000mg/100mg) was found in the locally grown rosehips. There is as much vitamin C in a cup of rosehips pulp as in 40 oranges.

In World War II, the people of England gathered wild-grown rosehips and made Vitamin C syrup for children. This was because German submarines were sinking many commercial ships: citrus fruits from the tropics were very difficult to import.

Rosehips also contain beta-carotene or Vitamin A which is a powerful antioxidant against free radicals and is therefore recommended for the prevention of wrinkles, aging of the skin, sunburns.

Because of its high medicinal value and potential source of Vitamin C, cultivation of different species of rosehip on commercial scale is recommended in northern areas of the country

### INDEPENDENCE DAY CELEBRATION AT PFI

Flag hoisting ceremony was observed at Pakistan Forest Institute, Peshawar on 14<sup>th</sup> August, 2009. The Director General, Syed Said Badshah Bukhari, directors, officers, forestry students and staff of the institute participated in the function. Children sang national anthem. The students delivered speeches on Pakistan movement and independence. In the end DG, PFI expressed his views on the occasion.



### PFI SCIENTIST COMPLETED DEGREE OF Ph.D.

Mr. Ghulam Ali Bajwa has joined his duty as Senior Research Officer (Silkworm Pathology) in Sericulture Division on 10<sup>th</sup> September, 2009 after completing degree of Doctor of Philosophy with distinction (CGPA 4/4). The doctoral study programme was conducted at Faculty of Forestry, Universiti Putra Malaysia (UPM), under the supervision of Associate Professor Dr. Faizah Abood. Topic of his thesis was "Biology of Tiger moth (*Atteva sciodoxa* Meyrick) Infesting Tongkat Ali (*Eurycoma longifolia* Jack) and its Infectivity by *Beauveria bassiana* (Balsmo-Crivelli) Vuillemin".