



Newsletter

Pakistan Forest Institute, Peshawar



Chief Patron: Syed Said Badshah Bukhari
Director General

January - March, 2010

Editor: Tanvir Ahmad Qureshi
Extension Specialist

NEWS OF FOREST EDUCATION

Hakim Shah
Director Forest Education

Many steps were taken for the improvement of forestry education system such as timely conduct of admissions, punctuality and discipline, organizing long awaited tours, working plan camp, survey tour and field engineering training, examinations and results.

Admissions

The M.Sc and B.Sc Forestry session 2009-2011 1st term classes have been started since 25th January, 2010 (M.Sc 2009-10 session) on Forest Management tour from 29th March to 14th April, 2010). To overcome the accommodation problem of newly admitted students, USAID hostel has been converted into a forestry student hostel and M.Sc session 2007-09 senior students have been shifted there since January, 2010.

Discipline

Measures have been taken to improve students discipline both in the Institute as well in the hostels. Programme Officers have been assigned the responsibility of Hostel Warden/House Tutors have to set in warden Lodge of their respective hostels from 7-9 pm; one hour each and maintain strict discipline. PT & Sports activities are observed regularly. The PFI Girls hostel, where 27 students of Peshawar University had been residing for one year under an agreement was vacated by 28th March to avoid unnecessary security risk and utilize the hostel in the best interest of forestry students.

Working Plan Tour

The long awaited Working Plan Camp of M.Sc. and B.Sc. Forestry session 2007-09 was arranged at Pakistan Forest Institute (PFI) Field Station Shinkiyari, Mansehra during 1-13 January, 2010.

Keeping in view the security condition in the country special security arrangements were made by District Police Officer



(D.P.O.), Mansehra for the security of students at the camp. With this arrangement, students collected field data without any risk. Relevant lectures were delivered by experienced field officers and students greatly benefited from their rich experience in preparation of working plan. Director General, PFI was the Chief Guest of the closing session whereas DFE, CF Abbottabad and other local forest

department officials also attended the session.

Survey Tour

Survey camp of B.Sc. and M.Sc. forestry students session 2009-10 was conducted from 24th of January to 2nd February, 2010 at field station Shinkiyari.

Forest Management Tour

Forest Management Tour for B.Sc. Forestry (Session 2008-2010) was conducted from 12-26 February, 2010.

During the tour, students visited sports Industries and Strategic Plantations at Saikot, irrigated plantations at Changa Managa followed by lectures delivered by DFO on management of irrigated plantation at Chichawatni. The students visited Bahawalpur, Cholistan desert, and Lal Soharna National Park. A lecture on irrigated plantation management was delivered by Malik Hayat, Forest Officer FSR&DP. The students also visited Sukkar riverian forests, Miami Research Station (Hyderabad) regarding experimental trials, Thal, Umarkot and Thata mangrove forest and coconut plantations. This tour provided an overview of management of various forest types in Pakistan to the students of B.Sc. forestry.

Examinations & Results

Supplementary examinations of M.Sc and B.Sc Forestry 1st term and 2nd term (four classes) were conducted from 19th to 26th December, 2009 and results of all classes had been declared on 21st and 27th January, 2010 respectively and all students declared passed. The 2nd and 3rd term Annual examinations of M.Sc and B.Sc Forestry were conducted from 13th February to 26th March, 2010 and the result are awaited. A new board of studies have also been constituted.

TRAINING OF FARMERS OF FATA AT PFI

M. Tahir Laeeq
Director, Forestry Research

Since establishment, Pakistan Forest Institute (PFI) has remarkable services in promoting forestry in the country. Training is one of the major activities of PFI which contributed significantly in the development of forestry sector. This Institute, not only produced forestry professionals at graduate and post graduate level, but also enhanced the skill of field staff of provincial/regional forest departments through inservice short term training courses. Besides, it disseminated the knowledge and transferred the technology and skill to farming community also.

Continuing this service, Forestry Research Division of PFI organized three short training courses on Community Forestry, each one of 3 days duration for farming community of FATA (Mohmand Agency) under FATA Rural Development Project from 16th to 18th, 23rd to 25th February and 2nd to 4th March 2010. Each

course consisted of training on Nursery and Planting Techniques, Range Management, Sericulture (Silkworm rearing) and Apiculture (Honeybee keeping). As a result of these training courses 44 farmers were trained. The training courses were continuously monitored by Mr. Younas Shah (Agency Training Coordinator) and Mr. Usman Ghani (Forestry Specialist) of FATA Rural Development Project, who appreciated the way of training and dedication of PFI officers (Resource Persons). The course participants were also awarded with certificates.

At the end of these training courses, Mr. Younas Shah highly appreciated Syed Said Badshah Bukhari, Director General, PFI and thanked him for providing this training facility to farmers of FATA in his prestigious Institute.



COMPARISON OF PROPERTIES OF INDIGENOUS TEAK WITH BURMESE TEAK

IQBAL MAHMOOD
Wood Seasoning & Preservation Officer

In 1990s Teak trees were planted at Changa Manga. Some trees of 13 years age were felled and brought at Pakistan Forest Institute, Peshawar to study their

technological properties. The standard methods were adopted to test the material for physico-mechanical properties. The results of locally grown Teak wood have been compared with the reported values of different properties of the same wood found in Burma. Burmese Teak is of the same density class as the locally grown at Changa Manga.

But in air-dry condition, indigenous Teak wood is superior to the Burmese Teak when compared with ultimate bending strength (Modulus of rupture, MOR), Fiber stress at elastic limit (Modulus of elasticity, MOE), maximum crushing strength parallel to grain and side grain hardness by 47%, 12%, 16% and 47% respectively.

Property	Pakistani Teak	Burmese Teak
Ultimate bending strength (Kg/cm ²)	1587	1082
Modulus of elasticity (Kg / cm ²)	114388	102041
Maximum crushing strength parallel to grain (Kg/cm ²)	718	616
Side grain hardness (Kg)	840	570

The local Teak wood has high value of cleavage (34 kg/cm) and tensile strength perpendicular to grain (33 kg/cm²). However, the ability of the wood to absorb sudden shocks (impact bending) is low which means the timber is not suitable where the impact of load is transferred as in case of sporting goods, railway sleepers, super structures etc.

On the basis of tests carried out, Pakistani Teak has considerable potential which can be used for construction, flooring, furniture, carving, molding poles, posts and exposed to wood work of every kind. The wood saws and works fairly well both by hand tools and machines. Due to high side and end hardness the timber is suitable for wood working operations where cutting, boring, jointing, carving etc. are required during its processing.

WINDBREAKS/SHELTERBELTS AND CROP YEILD

Tariq Mahmood, WMS
& **Zulfiqar Ali, RO**

Introduction

A windbreak or shelterbelt is a plantation usually made up of one or more rows of trees and shrubs planted in such a manner as to provide shelter from the wind and to protect soil from erosion. They are

commonly planted around the edges of fields on farms. If designed properly, windbreaks around a home can reduce the cost of heating and cooling and save energy. Windbreaks are also planted to help keep snow from drifting onto roadways and even yards. Other benefit includes providing habitat for wildlife and in some regions the trees are harvested for wood products. A further use for a shelterbelt is to screen a farm from a main road or motorway, mitigating noise from the traffic and providing a safe barrier between farm animals and the road.



Aerial view of field windbreaks in North America

J. H. Stoeckler, 1949, regarding the importance of shelter belts wrote that they may reduce fuel needs in house heating by as much as 20 % in cold climates. Beef cattle have been found to make better gain in weight when protected from the cold wind". He further mentioned that "In irrigated areas, shelter belts may result in less water being needed by the crops. The yield of the wheat and corn may be increased as much as 10 to 20 % in a zone extending out as 10 to 15 times the average height of the tree belt". Brenner *et al.*, 2003 found that growth of millet (*Pennisetum typhoides*) behind a wind-break varies considerably with changing macroclimate, species and windbreak type. Reducing the speed of wind conserve soil moisture for growing crops and decreases the energy available to cause soil erosion. In hot climates wind breaks may also provide some beneficial shading of yield crops. Keeping in view the potential significance of shelter belts there are immense possibilities of raising shelter belts and windbreaks in our extensive semi arid and arid areas with few important considerations such as control on grazing, restriction on shifting cultivation, stabilization of sand dunes and the suitable legislation to tackle this gigantic task of national importance.

BIOSOLIDS RECYCLING IN FORESTRY

Tanvir Ahmad Quresh, FC &
Sanam Zarif Satti, Biochemist

We all know about recycling metal, glass, plastic and paper and why it is

important for the environment. But few of us know about biosolids recycling. Biosolids recycling is a process of returning nutrients and organic matter back to where these materials came from the soil. Everyday millions of us flush used water down sinks, bathtubs, showers, and toilets. This wastewater ends up at a wastewater treatment plant, where the organic matter and nutrients in the wastewater are removed during the treatment process. After treatment to remove pathogens (i.e., disease-causing organisms) and reduce odor potential, the organic matter and nutrients become biosolids. Once this treatment is accomplished, biosolids are analyzed for beneficial properties and contaminant levels to ensure that the product is safe and beneficial.

To supply our ever increasing need for forest products, foresters are investigating ways to increase forest productivity. The use of biosolids in forestlands and on tree farms as a fertilizer and soil conditioner has resulted in rapid tree growth and increased timber production. A secondary benefit is a more productive forest, which can provide more food and cover for wildlife. Soils are often drastically disturbed where mining or construction activities take place. If left unchecked, soils disturbed by these activities can result in severe erosion and nearby surface waters can be impacted. Biosolids work to improve soil stability on steep slopes, promote rapid growth of vegetative cover, and reduce erosion.

TOXINS OF *BEAUVERIA BASSIANA*

Dr Ghulam ali Bajwa
Coordinator Sericulture

Beauveria bassiana produces several toxic secondary metabolites. Most of these toxins are primarily cyclic peptides of low molecular weight that possess antibiotic and insecticidal properties. Beauvericin is the most important toxic cyclic hexadepsipeptide compound. It consists of cyclic repeating sequence of three molecules of *N*-methyl phenylalanine alternating with three molecules of 2-hydroxyisovaleric acid. It is an ionophore and can dissolve in lipid bilayers and increases cell membrane permeability to specific ions. Abnormal ion transport across cell membrane disrupts the function of intact cell or organelles such as mitochondria. Beauvericin has also insecticidal, antibiotic and cytotoxic properties. It is a specific cholesterol acyltransferase inhibitor and is toxic against insects, murine and human cell lines. It can induce programmed cell death like apoptosis and cause cytolysis. bassianolide is another cyclo-

octadepsipeptide ionophoric compound. This compound acts like antibiotic similar to beavericin. Beauverolides are also peptides with similar structure to beavericin and bassianolide. These are the first microbial cyclodepsipeptides with demonstrated *in vivo* anti-arterosclerotic properties. The non-peptide secondary metabolites produced by *B. bassiana* are bassianin and tenellin. These yellow-coloured secondary metabolites inhibit the erythrocyte membrane ATPases. Among *B. bassiana* metabolites only bassiacridin is a toxic protein with high molecular weight. Many *B. bassiana* isolates also produce a secondary metabolite named oosporein. Oosporein is a dihydroxybenzoquinone red coloured pigment that acts as an antiviral compound as well as has antibiotic activity against gram-positive bacteria but has little effect on gram-negative. Oosporein has no antifungal and phytotoxic effects. Oosporein in combination with beauvericin and bassianolide prevents bacterial growth thus putrefaction of cadavers. This allows *B. bassiana* to grow and sporulate on intact cadavers without any competition with other microorganisms. Oxalic acid secreted by *B. bassiana* has synergistic action with *B. bassiana* conidial germination and cuticular penetration. This synergistic activity may be due to solubilisation of specific cuticular proteins by the acid.

CULTIVATION AND YIELD TRIALS OF *MATRICARIA CHAMOMILLA* (GUL-I-BABOONA) TO STANDARDIZE ITS CULTIVATION TECHNOLOGY

Muhammad Muslim, Medicinal Plants
Botanist/WMS

The name Chamomile originates from a Greek word which means "ground apple" which refers to the apple smell of Chamomile. German Chamomile is used in Spain for the preparation of a sherry that is called "apple". This is also the Spanish name for Chamomile. German Chamomile is of the genus *Matricaria*. The name *Matricaria* originates from the Latin (matrix means uterus) and comes from the former application for an irregular menstruation. The name Roman Chamomile suggests a longer history, but this plant is cultivated and used just since one century. Roman Chamomile is of the genus *Anthemis*. This name originates from Greek and means noble flower. Chamomile is nearly everywhere cultivated for one of the most known herbal teas. Roman Chamomile is also used for ages because of its beneficial qualities. German Chamomile is one of that most ancient herbal remedies. It was already known in the pre-Christian times and was described in Medieval plant book

with the same applications as nowadays. In Parkinson's herb book dating from 1656, bathing in Chamomile was recommended to reinforcement of healthy people and as a pain killer for ill people. The relaxing aroma was also inhaled as a snuff or smoked to ease asthma and to cure insomnia. The plant is also considered as "plant healer", because it the health promoting properties to plants that grow in its vicinity. The old Egyptians already used Chamomile. Nowadays in Egypt a lot of Chamomile is cultivate for own use and for the export. Chamomile pollen was found in the stomach of the mummy of Ramses II. The Egyptians honored Chamomile to the sun and worshipped this herb above all others because of its therapeutic qualities. Greek physicians gave Chamomile against fever and women illnesses.

In Hungary and Eastern Europe German Chamomile is bred on a large scale. It grows over whole Europe in the wild. The plant is found in meadow and wheat fields, at roadsides, on sunny hills and on rubble place. The plant flowers from May to August with at the tops flowers with yellow hearts and white petals that on the end of the flowering time bow down. The flowers have a honey like smell.

The chemical constituents of chamomile are: Ethereal oil (0,5-1.5 chamazulene), Choline, bitters matter (among which azulene), Flavonoids (among which: apigenine, luteoline, patuletine and quercitine) and Malic acid. The flowers of chamomile provide 1-2% volatile oils containing alpha-bisabolol and matricin. Tolerance can develop to the sedative action of chamomile if taken habitually. Chamomile is sometimes known as "the plant doctor", because it is thought to help the growth and health of many other plants, especially ones that produce essential oils. It is thought to increase production of those oils, making certain herbs, like mints (spearmint, oregano) and basil stronger in scent and flavor.

Chamomile tea is also thought to be useful to suppress fungal growth, for example, misting it over seedlings may prevent damping off. Chamomile is frequently an invasive species in agricultural fields. Farmers often must control chamomile's spread to maintain productivity of their fields. It is used as a fragrance in herbal skin care products. It had also been used in shampoos because of its property to add luster to the hair.

Introduction and cultural studies were initiated to standardize its cultural requirement and economic feasibility under Peshawar climatic conditions.

BARK BORERS:

The Most Destructive Forest Insect Pest of Pakistan

Naveed Ahmed Assistant Forest Entomologist

Bark borers are the most important and destructive forest insect pest of Pakistan and throughout world. The immature or larval stages of insects, particularly beetles and moths that feed on wood rather than leaves or plant juices are referred to as borers. All the woody parts of the tree from the buds and twigs to the trunk and roots are susceptible to borer attack. Most borers are attracted to trees that are weakened through drought, injury or disease, but some borer species can successfully attack healthy, vigorous trees. They attack on wide range of host trees but preferably attack on poplar, blue pine, and deodar. In 2001, bark borers appeared in epidemic form on blue pine forests of Murree and Azad Kashmir. According to an estimate bark beetles caused a loss of about Rs.290 million only in Murree Forest Division.

The borer breeds in the tree trunk of large dimension and side twigs. Usually the borer makes galleries girdling the branch at several points consequently the twig dries up completely. The borer which feeds under the bark makes an entrance tunnel. At the lower end of the tunnel, two or more egg tunnels are cut vertically, transversally or radially between the bark and the wood. The eggs are laid along the walls of the egg-tunnel and the larvae excavate slender mines or larval burrows.

Once borers have infested a tree, they can be difficult to control by one method. Then they can only be control by Integrated Pest Management (IPM) techniques. In IPM a number of control measures such as biological, cultural, mechanical, physical, use of sex attractants and biochemical methods are applied in such a way that they are complementary to each other control the pests effectively, and do not have any side effects. In these techniques chemical insecticides are used only as a last resort.

ARRIVAL OF FIRST PAKISTANI FEMALE DOCTORATE IN FORESTRY

Dr. Mamoona Wali Muhammad has resumed her duty as Assistant Professor of Forestry on 18th January, 2010. She has completed her Doctor of Philosophy degree in 3 years with distinction (CGPA 4/4), in Forest Management from University Putra Malaysia (UPM). She has the honor of being the first female forestry professional in Pakistan and now she got

the unique honor of being First Ph.D. Female in Forestry in Pakistan.



The goal of her research was to assess and evaluate the impacts of participatory forestry watershed programs on the socioeconomic conditions of local people and forest resource development, with emphasis on participation. Her doctorate work was based on field survey research in districts of Hazara and Azad Jammu & Kashmir, Pakistan. She greatly acknowledged all the support and services provided by N.W.F.P. and A.J.K., Forest Departments. Her focus of study was to assess the impacts of Peoples' Participation in Forest Management in selected programs. Her supervisory committee also includes Dr. Rusli Bin Mohd., Associate Professor & Ex-Dean Faculty of Forestry, UPM (Supervisor), Dr. Bashir Ahmed Wani, Ex-IGF (external member) and Dr Shafique ur Rehman, PD Forestry Mega Project - Carbon Sequestration, MOE.

SHORT NEWS New Inductions in PFI

Mr. Atif Majeed joined PFI as Deputy Director (Technical) (BPS-18) on February 2, 2010 through selection by FPSC. He did M.Sc Forestry from PFI, Peshawar in 1998. Previously he was serving as District Officer Forests, Jhelum, Punjab Forest Department.

Mr. Muhammad Bilal Zia joined PFI as Forest Geneticist (BPS-18) through selection by FPSC. He did post graduation in Plant Breeding & Genetics from University of Agriculture, Faisalabad in 2001. Previously he was serving as Assistant Research Officer at Maize & Millets Research Institute, Sahiwal.

Mr. Rao Naumaan Nasim Khan joined PFI as Assistant Forest Chemist (BPS-17) through Federal Public Service Commission on 15th March, 2010. He did M.Sc (Hons) Organic Chemistry from University of the Punjab. He has previously served as lecturer in chemistry at a Degree College in Lahore.