INVASIVES

Newsletter of the Asia-Pacific Forest Invasive Species Network (APFISN)

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Threats

- Gorse (*Ulex europeus*)

News column

- Scientists' contribution to invasion in Antarctica

New publications

- The role of fruit traits of bird-dispersed plants in invasiveness and weed risk assessment
- Forest roads facilitate the spread of invasive plants
- Predicting the distribution of perennial pepperweed (*Lepidium latifolium*), San Francisco bay area, California
- Breaching the dispersal barrier to invasion: quantification and management
- Tree invasion in managed tropical forests facilitates endemic species
- Evolution of weediness and invasiveness: charting the course for weed genomics
- Detecting an invasive shrub in deciduous forest understories using remote sensing
- Predicting invasions in Australia by a neotropical shrub under climate change: the challenge of novel climates and parameter estimation

Recent books

- Biopesticides: Pest Management and Regulation
- Invasive Plant Medicine: The ecological benefits and healing abilities of invasives

Forthcoming symposia/workshops

- 8 - 12 March 2010. 22nd Asian Pacific Weed Science Conference, Lahore, Pakistan
- 27 - 29 April 2010. International Invasive Ant Workshop, Australia

The Asia-Pacific Forest Invasive Species Network (APFISN) has been established as a response to the immense costs and dangers posed by invasive species to the sustainable management of forests in the Asia-Pacific region. APFISN is a cooperative alliance of the 33 member countries in the Asia-Pacific Forestry Commission (APFC) - a statutory body of the Food and Agriculture Organization of the United Nations (FAO). The network focuses on inter-country cooperation that helps to detect, prevent, monitor, eradicate and/or control forest invasive species in the Asia-Pacific region. Specific objectives of the network are: 1) raise awareness of invasive species throughout the Asia-Pacific region; 2) define and develop organizational structures; 3) build capacity within member countries and 4) develop and share databases and information.

Ulex europeus - Habit

INVASIVES, bimonthly newsletter of the Asia-Pacific Forest Invasive Species Network (AFPISN) is intended to share information among countries in the Asia-Pacific region on Forest Invasive Species(FIS) and the threats they pose in the region. If you have any items of news value on FIS to share between national focal points of APFISN and more widely among foresters, agriculturists, quarantine personnel and policy makers, please pass them on to the editor - Dr. K. V. Sankaran, APFISN Coordinator, Kerala Forest Research Institute, Peechi-680 653, Kerala , India (sankaran@kfri.org). The newsletter is supported by the Food and Agriculture Organization of the United Nations (FAO) and USDA Forest Service.

Gorse (*Ulex europeus*)

Ulex europeus (Fabaceae) is a spiny, perennial weed of Central and Western European origin, where it has long been cultivated for hedgerows. This ornamental plant is a very successful and tenacious weed which is extremely competitive. Gorse can displace cultivated and native plants and alter soil conditions. Vigorous stands grow outward, crowding out all other vegetation and forming a center of dry, dead vegetation. It creates an extreme fire hazard due to the abundant dead material from oily, highly flammable foliage and seeds. The global invasive species database includes this plant among the 100 "world's worst" invaders. It is currently distributed in Australia, China, Indonesia, Japan, New Zealand, Sri Lanka and the USA. In India, the bio status of this species is not specified. The species can be recognized by its thorny stems, yellow flowers and the conspicuous appendage over the seed scar. The ability to fix nitrogen enables this plant to colonize and dominate areas with poor soils.

Ulex europeus - leaves and flowers

Gorse can grow ~3 -10 feet high. The stem is woody when mature, longitudinally ridged, hairy, with numerous long spines that are modified primary branches. Extended branches may have primary, secondary and tertiary spines. Stem color changes from green to brown when mature and the prostrate stem has the ability to root. Leaves are alternate, about 2.5 cm long, reduced to dorsally flattened spines. Flowers are pea-like, yellow and showy, fragrant, mostly in leaf axils and terminal clusters. Sepals are deeply 2-lipped, yellow, densely hairy, about 0.75 to 1.25 cm long, with ovate standard. Wings and keel are of equal length. The filaments arise from 10 united stamens. Pods are hairy, 1 to 2 cm long, containing 2 to 6 seeds. Seeds are 2 to 3 mm long, rounded at one end, broader and shallowly notched at the other, with a conspicuous straw-colored appendage over the scar, smooth, shiny, olive-green to brownish. The seeds are so small that there will be 150,000 seeds/kg. Seeds may remain dormant yet viable in the soil for up to 30 years, with one report of 70 years of dormancy. When the pods burst they scatter seeds for several feet. The root system consists of a taproot, lateral roots and adventitious roots. The seed dispersal is through movement of goods and livestock.

Gorse infestation

Gorse seed

This weed grows profusely in agricultural areas, coastlands, natural forests, planted forests, range/grasslands, roadsides, ruderal/disturbed areas, scrub/shrublands, water courses and wetlands. It can extract and retain plant nutrients such as calcium, magnesium, and sodium, thereby changing the nutrient dynamics of the soil. The geographical distribution of gorse is mainly determined by temperature. It cannot survive in arid climates or in continental regions. Day length may also affect its latitudinal distribution, as short-day conditions inhibit maturation and prevent thorn formation and flowering. Gorse will grow on most soil types and on shady slopes with high soil moisture and good drainage. Optimal growth is at soil pH of 4.5-5. Because of various characteristics of the plant, the soil is often bare between individual gorse plants, which increases erosion on steep slopes where gorse has replaced grasses or forbs.

Being spiny and mostly unpalatable when mature, gorse reduces pasture quality where it invades rangeland. It excludes grazing animals from rangelands and pasture. Gorse understorey in forests interferes with cultural operations, increasing pruning and thinning costs, and can interfere with the growth of conifer seedlings. A beautiful yellow or orange dye is obtained from gorse flowers. The flowers are strongly scented, resembling coconut. Gorse is an excellent pioneer species for poor soils and areas with maritime exposure. The plant is used as a pesticide in some countries. The ashes from the burnt

wood are rich in potassium and can be used in making soap.

The mechanical control measures include hand pulling, hoeing and chopping. Prescribed burning is also used to control the thickets. Glyphosate is an effective control against gorse. Other chemicals like, triclopyr and diquat are also used. The cultural methods include use of fast-growing tree species to shade out gorse. The combined effect of competition of white clover (*Trifolium repens*) and the symbiont Rhizoctonia fungi will prevent gorse establishment. In the U.S., in 1953, the seed weevil *Apion ulicis* was introduced from France for the bio-control of gorse, but results were poor. Several insect enemies of gorse are currently being tested for biological control. Goat grazing has also been shown to be effective in controlling the weed.

Biocontrol weevil - *Apion ulicis*

News column

Scientists' contribution to invasion in Antarctica

How were exotic species introduced in Antarctica? South African researchers claim that visitors and scientific operations being carried out in Antarctica may have been the culprits. Introductions must have been unintentional through clothes, luggage and cargo. Invasive species like *Poa annua* have already become established and threaten the biodiversity of the continent, especially in sub-Antarctic regions with relatively mild temperatures and high rainfall. It may also be noted that global warming results in the expansion of the range of invasive species. However, most of the studies on invasion biology have been on the dynamics of newly introduced species which dominate the continent and on appropriate methods of control. Comparatively few studies have examined how invasive species were introduced in a new area in the first place. The pathways of introduction in Antarctica can be tracked easily because the visitors enter through well defined points in the continent. The researchers watched the newly arriving cargo and luggage to the South African National Antarctic Program and identified all the exotic seeds. The arrival of around 1,400 seeds belonging to 99 taxa was thus recorded. Of these, at least 64% of the seeds were noted to be exotic to the Antarctic region. Through elaborate methods, the researchers estimated what percentage of the seeds carried into Antarctica are actually left behind. The estimate suggested a drop- off of 53% from clothing and 20% from cargo. They also noted that during the expeditions, native plants are transported from one part of the continent to other parts. All these result in ecological impacts which are yet to be assessed. The study clearly showed that the transport hubs act as stepping stones for invasion. Against this background, intensive control efforts need to be concentrated in the loading and drop off areas. Cargo containers should be designed to reduce the trapping of seeds and should be cleaned and inspected carefully after handling cargo. Irradiation of clothing may be an option to reduce germination of captured seeds. Another alternative is to ship new clothing to a research station and leave it after use.

Fieldwork on Melnik Peak, Antartica

New publications

Gosper, C.R. and G.V. Smith. 2009. The role of fruit traits of bird-dispersed plants in invasiveness and weed risk assessment. Diversity and Distributions, 15: 1037 - 1046.

Mortensen, D.A., Rauschert, E.S.J., Nord, A.N. and B.P. Jones. 2009. Forest roads facilitate the spread of invasive plants. Invasive Plant Science and Management, 2: 191 - 199.

Vanderhoof, M., Holzman, B.A. and C. Rogers. 2009. Predicting the distribution of perennial pepperweed (*Lepidium latifolium*), San Francisco bay area, California. Invasive Plant Science and Management, 2: 260 - 269.

Lee, J.E. and S.L. Chown. 2009. Breaching the dispersal barrier to invasion: quantification and management. Ecological Applications, 19: 1944 - 1959.

Fischer, L.K., Lippe, M. and I. Kowarik. 2009. Tree invasion in managed tropical forests facilitates endemic species. Journal of Biogeography, 36: 2251 - 2263.

Stewart Jr, C.N., Tranel, P.J., Horvath, D.P., Anderson, J.V., Rieseberg, L.H., Westwood, J.H., Smith, C.A.M., Zapiola, M.L. and K.M. Dlugosch. 2009. Evolution of weediness and invasiveness: charting the course for weed genomics. Weed Science, 57: 451-462.

Wilfong, B.N., Gorchov, D.L. and M.C. Henry. 2009. Detecting an invasive shrub in deciduous forest understories using remote sensing. Weed Science, 57: 512 - 520.

Klinken, R.D., Lawson, B.E. and M.P. Zalucki. 2009. Predicting invasions in Australia by a neotropical shrub under climate change: the challenge of novel climates and parameter estimation. Global Ecology and Biogeography, 18: 688 - 700.

Recent Books

Biopesticides: Pest Management and Regulation: Eds. W. Grant, D. Chandler, J. Greaves, G. Prince, M. Tatchell and A. Bailey, CABI Publishing, 2009. This book addresses the challenges of insufficient information and imperfectly understood regulatory processes in using biopesticides. It takes an interdisciplinary approach providing internationally comparative analyses on the registration of biopesticides and debates future biopesticide practices.

Invasive Plant Medicine: The ecological benefits and healing abilities of invasives: By Timothy Lee Scott, Healing Arts Press, 2009. This book reveals how the "invasives" restore natural balance and biodiversity to the environment and examines the powerful healing properties offered by 25 of the most common invasive plants growing in North America and Europe. The book includes the following: a detailed description of the physiological actions of each plant and their uses in traditional healing practices; tips on harvesting, preparation and dosage; contraindications; and any possible side effects. This is the first book to explore invasive plants not only for their profound medical benefits, but also with a deep ecological perspective that reveals how plant intelligence allows them to flourish wherever they grow.

Forthcoming Symposia / Workshops

8 - 12 March 2010. 22nd Asian Pacific Weed Science Conference, Lahore, Pakistan. The theme of the workshop is "Judicious Weed Management- Road to Sustainability". The major topics to be covered are: 1) Weed biology, ecology and systematic; 2) Integrated weed management; 3) Weed physiology; 4) Chemical weed control; 5) Biological weed control; 6) Parasitic weeds; 7) Herbicide resistance; 8) Weed seed dormancy and soil seed banks; 9) Species shift and herbicides; 10) Invasive weeds and agro-biodiversity; 11) Aquatic weed management; 12) Allelopathy; 13) Genetically modified organisms; 14) Weed management in agronomic and horticultural crops; and 15) Weed management in turfs and forests. Contact: Prof. Dr. Gul Hassan, e-mail: secretarywssp@yahoo.com

27 - 29 April 2010. International Invasive Ant Workshop, Australia. The aim of the workshop is to facilitate networking among people involved in invasive ant management, as well as to improve the incorporation of research and ant biology into management. The international workshop, which will be hosted by CSIRO in Darwin, will be limited to 60 participants. As such, priority will be given to people who are actively involved in decision making and ground work of invasive ant management, especially eradication programs. Contact: iiamw@csiro.au

Compiled and edited by Dr. K. V. Sankaran, APFISN Co-ordinator on behalf of the Asia-Pacific Forest Invasive Species Network. For more information on the APFISN, please contact your national focal point or the APFISN Co-ordinator or Mr. Patrick Durst, Senior Forestry Officer, FAO Regional Office for Asia and the Pacific, 39 Phra Atit Road, Bangkok. Email: patrick.durst@fao.org