



Invasives

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

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About APFISN

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.



Ageratina adenophora - habit



INVASIVES, the Newsletter of the Asia-Pacific Forest Invasive Species Network (APFISN) 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). This newsletter is supported by the Food and Agriculture Organization of the United Nations (FAO) and USDA Forest Service.



Ageratina adenophora (Crofton weed)

Ageratina adenophora (Asteraceae), native to South America, is a semi-woody sub shrub, growing up to 3 m in height with trailing branches which are purplish to chocolate brown in colour. It was widely introduced for ornamental purposes but spread from gardens to invade a variety of ecosystems wherever introduced. The plant produces upright, branched stems from a woody stock, forming dense stands preventing regeneration and establishment of native plants. In Australia, it is often misidentified as *Ageratina riparia*, but the latter is a prostrate shrub. Crofton weed is currently widespread in Australia, Bhutan, China, Fiji, India, Indonesia, Nepal, New Zealand, Papua New Guinea, Philippines and Sri Lanka in the Asia-Pacific region. Roots of the plant are yellowish in colour and emit a distinct carrot-like smell when broken.



Closer view of flowers

Stems of Crofton weed are purple, terete, erect, glandular-puberulent. Leaves are opposite, median ones larger, ovate-deltoid, 7-10 cm long, 4-7 cm wide, apex acuminate, base obtuse to very broadly cuneate or truncate, sparsely pilose on both surfaces, 3-nerved, margins are crenate, petiole is 4-5 cm long, upper leaves are gradually smaller towards the inflorescence. Inflorescence composed of loose compound corymbs, heads ca. 6.5 mm long, 6 mm in diameter, peduncle 8-14 mm long, densely pubescent; involucre cylindric, ca. 3-4 mm long; bracts ca. 25, 3 or 4 seriate, outer ones narrowly lanceolate, inner ones narrowly oblong, apex acute, base obtuse, margins membranaceous, ciliate; florets ca. 70-80, white; receptacle glabrous, areolate. Achenes are black, 1.5 mm long, 5-angular, glabrous. Pappus of 8-10 bristles, ca. 3.5 mm long. Seeds are very small, light in weight, brown to black in colour, with a parachute of white hairs. They are produced in copious numbers and dispersed mainly through water and wind.



Crofton weed infested area; seeds (inset)

Ageratina is common in dry to wet forests, river banks, grasslands and disturbed areas. It prefers moist and nutrient rich soil for profuse growth. The plant grows well in sub humid climates and frost-free areas where rainfall exceeds 1,500 mm per year. It can tolerate a wide range of environmental conditions and salinity.

The plant is poisonous – especially to livestock. It is listed as a noxious weed in many parts of the world. The dense stands reduce crop yield and affect the carrying capacity of grazing lands. It can aggressively displace native plants through competition and later form mono-specific stands. Farmers are compelled to abandon their land due to infestation by the weed. The high reproductive potential, including vegetative reproduction, and adaptability to a wide range of environmental conditions foster its potential for invasion. The seeds are often seen as a contaminant in cereal, stock-feeds, forage seeds, soil, sand and gravel. The seeds are also transmitted through mud attached to moving vehicles.

An oil taken from the plant has some antifungal and insecticidal qualities. It is used to control aphids, ants and weevils in stored grains. The oil is also used for the production of xylitol.

Slashing of the weed followed by ripping/ploughing and sowing desirable pasture species is an excellent method of control. Digging out the weed is effective for small populations. Application of chemicals such as glyphosate, 2, 4 - D amine and triclopyr are effective for short term control. Introduction of a biocontrol agent viz., *Procecidochares utilis*, a gall fly, to Hawaii, parts of Australia and India was successful, but the degree of damage caused fluctuated because of parasitism by indigenous hymenopteran insects. In Hawaii, introduction of the fungus viz., *Entyloma compositarum* was effective in controlling the weed.

Ecologically-Based Invasive Plant Management - A new model

Scientists from USDA's Agricultural Research Service (ARS) in Burns successfully developed a new matrix called Ecologically-Based Invasive Plant Management (EBIPM) for managing invasive alien plants. The model was the result of over a decade of research in the field and is intended to help land managers to recognize the variation in rangeland degradation in different landscapes. The model also helps to boost the success rate of restoring native vegetation on damaged landscapes. It was developed by Dr. Roger Sheley, a scientist from ARS by synthesizing a range of findings from the literature and field research. It is based on three general causes of plant succession such as site availability, species availability and species performance. Dr. Sheley and his colleagues identified that the plant succession dynamics is influenced by site-specific ecological processes. They identified how this process is modified by environmental and human factors which affect plant establishment and long term vegetation change. This information can successfully be used to tune the processes and mechanisms which influence plant succession. The model was tested in three sites that had varying degrees and types of damage due to invasive plants. It was possible to increase the chances of restoration success of the sites by 66% by using this model compared to the traditional approach of weed management. It is noted that EBIPM is a valuable tool for land managers in the western rangeland where infestation by cheatgrass and resultant wildfires limit area for livestock grazing. The paper is published in the Journal 'Rangeland Ecology and Management'.

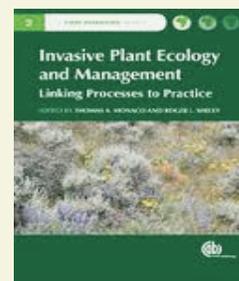


New publications

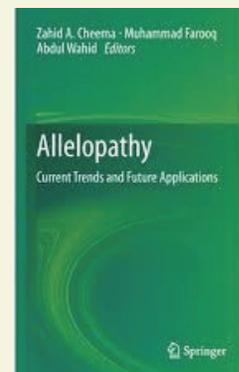
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Books

Invasive Plant Ecology and Management: Linking Processes to Practice. Eds. T.A. Monaco and R.L. Sheley. CABI, 2012. Bringing together ecology and management of invasive plants within natural and agricultural ecosystems, this book bridges the knowledge gap between the processes operating within ecosystems and the practices used to prevent, contain, control and eradicate invasive plant species. The book targets key processes that can be managed, the impact of invasive plants on these ecosystem processes and illustrates how adopting ecologically based principles can influence the ecosystem and lead to effective land management.



Allelopathy: Current Trends and Future Applications. Eds. Zahid A. Cheema, M. Farooq and Abdul Wahid, Springer, 2013. Allelopathy is an ecological phenomenon by which plants release allelochemicals into the environment, influencing the growth and survival of other organisms. In this book, leading scientists in the field synthesize the latest developments in allelopathy research with special emphasis on its application in sustainable agriculture. The main topics dealt with in the book include: 1) ecological implications, such as the role of allelopathy during the invasion of alien plant species; 2) regional experiences with the application of allelopathy in agricultural systems and pest management; 3) use of microscopy for modeling allelopathy; 4) allelopathy and abiotic stress tolerance; 5) host allelopathy and arbuscular mycorrhizal fungi; 6) allelopathic interaction with plant nutrition; and 7) molecular mechanisms of allelopathy. This book is an invaluable source of information for scientists, teachers and advanced students in the fields of plant physiology, agriculture, ecology, environmental sciences, and molecular biology.



Future events

4 - 8 March 2013. 4th International Symposium on Biological Control of Arthropods, Pucon, Chile. The goal of this Symposium is to create a forum where biological control researchers and practitioners can meet and exchange information and to promote discussions of up to date issues affecting biological control. Special emphasis will be on the use of parasitoids and predators as biological control agents. The Symposium will discuss all approaches to biological control: conservation, augmentation, and importation of natural enemy species for the control of arthropod targets, as well as transversal issues. The meeting is intended to stimulate ideas by presenting new information. Therefore, all speakers are expected to present original data from projects dealing with predators and parasitoids, avoiding overviews, summaries, or well known material. Contact Email: isbca2013@isbca.org.

21 -25 April 2013. 18th International Conference on Aquatic Invasive Species, Ontario, Canada. This conference series is a basic platform for the international community working on aquatic invasive species for discussing how the emerging issues in our ecosystem due to invasive species could be addressed. The main objectives of the Conference are to: 1) review accumulated scientific knowledge; 2) present the latest field research; 3) introduce new technological developments for prevention, monitoring and control; 4) discuss policy and legislation; and 5) mechanisms to raise awareness among the general public through education and outreach initiatives. For more information visit the website: www.icaais.org

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